Air Force Junior Reserve Officer Training Corps

Curriculum Guide

2019

Jeanne M. Holm Center for Officer Accessions and Citizen Development
CURRICULUM GUIDE

2019 – 2020
Academic Year

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- AFMAN 36-2236, Guidebook for Air Force Instructors

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- AFH 36-2235 Series: Information for Designers of Instructional Systems

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Preface

Air Force Junior Reserve Officer Training Corps (AFJROTC) is a program designed to develop citizens of character dedicated to serving their nation and community. To support this mission, the Academic Affairs Directorate of the Jeanne M. Holm Center for Officer Accessions and Citizen Development (Holm Center) produces “world-class” academic materials for AFJROTC units worldwide. A comprehensive description of the academic program is contained in this AFJROTC Curriculum Guide. The guide is a relevant, informative tool designed to assist school leadership and AFJROTC instructors plan and implement their curriculum programs.

Each AFJROTC class consists of three components—aerospace science, leadership education, and a wellness program. Citizenship and character education, the heart of the curriculum program, is primarily embedded in the leadership education series of courses, while sense of service and education in science and technology related aerospace science is primarily found in the aerospace science series of courses. Thus, the typical high school student will spend two clock hours per week studying LE material, two more on AS subject matter and a fifth hour in wellness education, culminating in 120 -180 contact hours per year for a single AFJROTC course offered at the host school. The flexibility of our curriculum design should enable you to meet the needs of your programs and accomplish the requirements set forth by your district and/or state.

To reinforce what is taught in the classroom, students participate in many outside activities such as field trips to military bases, aerospace facilities and industries, museums, civilian airports and other areas related to aerospace education. AFJROTC units also offer the opportunity to participate in co-curricular activities to include in drill and ceremonies, summer leadership schools, and honorary academic groups. Additionally, community service projects are a major part of the AFJROTC experience and helps instill a sense of civic pride and citizenship.

The AFJROTC Curriculum Guide has four parts:

“Part I – The AFJROTC Curriculum Program” describes the academic program, curriculum materials, and development, structure, and implementation of the curriculum. It expands on the curriculum development process and writing objectives and tests; 21st century teaching, learning, and assessments; and the course planning and scheduling process.

“Part II – Aerospace Science Courses” presents the menu of courses in the aerospace science series to include A Journey Into Aviation History, The Science of Flight: A Gateway to New Horizons, Cultural Studies: An Introduction to Global Awareness, Exploring Space: The High Frontier, Management of the Cadet Corps, Survival, Aviation Honors Ground School, and the AFJROTC Honors Senior Project. Twelve Science, Technology, Engineering, & Math (STEM) opportunities have also been added. These hands-on, mind-on activities help cadets understand how STEM is useful in their world and make connections to careers they may not have considered.
“Part III – Leadership Education Courses” covers the leadership education series of courses to include Traditions, Wellness, and Foundations of Citizenship; Communication, Awareness, and Leadership; Life Skills and Career Opportunities; Principles of Management; Drill and Ceremonies; and the wellness program. Leadership Electives have also been added, these electives are intended to build upon Holm Center provided leadership education and skills development curriculum.

“Part IV – Supplemental Materials and Resources” provides items to enhance the courses. The materials include: a comprehensive step-by-step approach to college financing and admissions, a program to inspire and prepare you as future adults for success, and another program that builds basic personal finance skills to lay a solid foundation for financial independence and future financial decisions. This section also includes free educational resources and lists NASA Educator Resource Centers by state so teachers can request materials and services.

Our AFJROTC academic program is a showcase for 21st century teaching, learning, and assessments. Having transformed our curriculum into the 21st century, we will continue our quest to create the best academic materials for our outstanding AFJROTC units worldwide.

The AFJROTC Curriculum Branch/DEJ
Holm Center Academic Affairs Directorate
The Junior ROTC program began in 1911 in Cheyenne, Wyoming. The originator of this idea was Army Lieutenant Edgar R. Steevers, assigned the duty of inspector-instructor of the organized military of Wyoming. The National Defense Act of 1916 authorized a junior course for non-college military schools, high schools, and other non-preparatory schools; the Army implemented Junior ROTC in 1916. Public Law 88-647, commonly known as the Reserve Officer Training Corps Vitalization Act of 1964, directed the secretaries of each military service to establish and maintain Junior ROTC units at public and private secondary schools which apply for and are eligible according to the regulations established by each secretary. Such schools must provide a course of military instruction not less than 3 years in length as prescribed by the military department concerned.

With a modest beginning of 20 units in 1966 Air Force Junior Reserve Officer Training Corps (AFJROTC) has grown to 900 high schools throughout the world, including units located in the Department of Defense Schools in Europe, the Pacific and Puerto Rico. Junior ROTC enrollment worldwide includes over 121,000 cadets. Only boys were allowed as cadets in 1966, but Public Law 93-165 amended the requirement that a Junior ROTC unit have a minimum number of physically fit male students, thus allowing female students to count toward the minimum students needed for a viable unit. In 1972 the enrollment included 2,170 females making up 9% of the corps. Since then the number of females has increased to over 38% of the cadet corps.

The AFJROTC program provides citizenship training and an aerospace science program for high school youth. Enrollment in the AFJROTC program is open to all young people who are in grades 9-12, physically fit, and are United States citizens. Host schools are selected upon the basis of fair and equitable distribution throughout the nation. Retired Air Force commissioned and noncommissioned officers who are full-time faculty members of the participating high school and employed by the local school board teach AFJROTC classes.
The “mission” of the AFJROTC program is to “Develop citizens of character dedicated to serving their nation and community.”

The “goals” of the AFJROTC program are to instill:

- The values of citizenship,
- Service to the United States,
- Personal responsibility, and
- A sense of accomplishment.

The “objectives” of AFJROTC are to educate and train students in citizenship and life skills; promote community service; instill a sense of responsibility; and develop character and self-discipline through education and instruction in air and space fundamentals and the Air Force's core values:

- Integrity First
- Service Before Self
- Excellence In All We Do

This program will enable the students to:

- Develop a high degree of strong morals, self-esteem, self-reliance, personal appearance, and leadership.
- Adhere to the values of integrity, service, and excellence.
- Increase their understanding of patriotism and responsibilities as US citizens.
- Participate in community service activities.
- Expand their skills of critical thinking and problem solving, communication and collaboration, and creativity and innovation.
- Demonstrate military customs, courtesies, and traditions and develop habits of order, discipline, and social skills.
- Acquire a broad-based knowledge of aerospace studies and leadership education.
- Strive to graduate from high school and prepare for college and careers in the 21st century.
- Cultivate a commitment to physical fitness and a healthy lifestyle.
Air Force Junior ROTC was awarded continuing accreditation with the Southern Association of Colleges and Schools Council on Accreditation and School Improvement (SACS CASI) on 3 March 2016 by the AdvancED Accreditation Commission. AdvancED is the parent organization of SACS CASI. The AdvancED Accreditation Commission is a national panel that reviews and takes action on all SACS CASI accreditation recommendations. A copy of the letter and certificate are included on the following pages.

AFJROTC was first awarded accreditation by the Commission on International and Trans-Regional Accreditation (CITA) Board of Directors on 29 November 2005; they have maintained continuous accreditation since then. To achieve accreditation, AFJROTC has undergone and successfully completed rigorous self-studies and site evaluations conducted by the CITA and AdvancED teams of experienced educators.

In summer 2008 CITA became part of AdvancED, and the AdvancED standards and protocol took effect 1 July 2009.
March 3, 2016

Air Force Junior Reserve Officer Training Corps (AFJROTC)  
60 W Maxwell Blvd  
Montgomery, Alabama 36112-5951

Dear Administrator:

Congratulations! Air Force Junior Reserve Officer Training Corps (AFJROTC) has been awarded accreditation by the North Central Association Commission on Accreditation and School Improvement (NCA CASI), the Northwest Accreditation Commission (NWAC) and the Southern Association of Colleges and Schools Commission on Accreditation and School Improvement (SACS CASI), the regional accrediting agencies that span the AdvancED global network. This action was taken by the Accreditation Commission at its meeting on January 28, 2016.

A certificate that indicates the term of your accreditation is enclosed. Throughout this term of accreditation, Air Force Junior Reserve Officer Training Corps (AFJROTC) must continue to engage in the responsibilities required of all institutions to maintain accredited status as outlined in the AdvancED Accreditation Policies and Procedures available on our website at www.advanc-ed.org/services/policies-and-procedures. Your accreditation signifies your commitment in pursuit of educational excellence. You can take pride in your achievement and so can your community. The regional agencies (NCA CASI, NWAC, and SACS CASI) provide your institution with a highly regarded and rigorous accreditation that is recognized throughout the world.

As part of your External Review report, you received an Index of Education Quality™ (IEQ™) score. The IEQ provides a holistic measure of your institution’s overall performance on indicators and evaluative criteria used in the accreditation protocol. As a formative tool for improvement, it pinpoints areas of success as well as areas in need of support and/or focus. Using the IEQ, you have the opportunity to focus your attention, activities and actions resulting in positive impact and measurable improvement designed to optimize learning for every student. As your institution documents these changes and submits them for review, your IEQ scores are updated to reflect this progress and guide the next steps on your improvement journey. To learn more about the IEQ, please visit www.advanc-ed.org/services/overview-index-education-quality.

As an accredited institution, you are part of the AdvancED global network of over 32,000 schools and systems in more than 70 countries that are committed to continuous improvement through accreditation. Our state, national, and international offices offer a wide range of products and services dedicated to institutional improvement and accreditation: state-of-the-art technology solutions including student observations, surveys, and diagnostic applications; targeted improvement services; workshops and conferences. Please check the Improvement Services and Professional Learning sections at www.advanc-ed.org for a full list of services and upcoming events.
Finally, promoting your accreditation is one of the easiest things that you can do to raise awareness of the importance of continuous improvement of education in your community. To help you celebrate your accreditation, we are providing you with a press release that you may share with your local media. You can access the press release by visiting www.advanc-ed.org/communicationskit. In the kit, you also will find brochures, accreditation seals, and other promotional items to display your pride in your institution’s accreditation.

If you have questions regarding the enclosed certificate, e-mail us at accreditation-certificates@advanc-ed.org. Our AdvancED Accreditation Office is available to answer any questions you may have as well and can be reached at 888.41 EDNOW (1.888.413.3669). We look forward to serving you now and in the future.

Sincerely,

Mark A. Elgart

Mark A. Elgart, Ed.D.
President/CEO AdvancED
This is to certify that

Air Force Junior Reserve Officer Training Corps (AFJROTC)

has met the criteria for educational quality established by the
AdvancED® Accreditation Commission and is hereby presented this

Certificate of Accreditation

by the NCA Commission on Accreditation and School Improvement,
the Northwest Accreditation Commission, and the
SACS Commission on Accreditation and School Improvement.

6/30/2021
Valid Through Date

Creating a world of opportunities for every learner.

Mark A. Elgart, Ed.D.
President and CEO, AdvancED®
Cadets receive credit toward high school graduation by successfully passing AFJROTC classes. Aerospace Science study includes the history of aviation, cultural awareness of major world regions, science of flight, space exploration, cyber, survival and corps management. Through the study of history of aviation, cadets will learn about the development of flight throughout the centuries. From the science of flight, students will become acquainted with the aerospace environment, weather, the human requirements of flight and the principles of navigation. Space exploration will equip students with the latest information available in space exploration and space science; the basic concepts of space are in this course. The science of flight and space courses are intended to complement material taught in high school math, physics, and other science-related courses.

Through cultural studies, students will learn to see their world through many different perspectives. This course introduces students to the study of world affairs, regional studies, and cultural awareness. Students will learn to explore and discover the processes that shape the Earth, the relationships between people and environments, and the links between people and places.

Leadership Education offers students many opportunities to shape their character. Students will learn about character development while many character-building topics are discussed. Elements of good citizenship are instilled in students. They are introduced to the Air Force organizational structure, uniform wear, military customs and courtesies, flag etiquette, citizenship in the United States, first aid, health and wellness, fitness, individual self-control, and basic drill and ceremonies. They will learn to listen and think critically, effective communications, how to prepare for leadership, how to build personal awareness, key elements of building and encouraging effective teams, and key behaviors for becoming a credible and competent leader. Students will also learn about the importance of charting a career path, specific career options, how to create a personal budget and financial plan, how to write a resume, how to interview for a job, how to apply for college, the principles of management, making decisions, problem solving, human relations, and life skills.

The Holm Center Academic Affairs Directorate provides the curriculum materials needed to teach all AFJROTC courses—textbooks, instructor guides, student-centered learning methods/materials, support videos, and in limited cases Instructional DVDs. **HQ-Logistics provides the Classroom Performance System (CPS)/Turning Technologies (NXT/TPC) hardware. Holm Center provided textbooks are currently distributed to AFJROTC units to be used as classroom sets, however, if instructors choose to issue textbooks to cadets these textbooks must be collected at the end of each term for reissue. All Aerospace Science and Leadership Education courses contain textbooks with accompanying instructor guides and DVDs. AFJROTC curriculum is written at the 9th–12th grade reading level. Student workbooks are considered expendable items and do not have to be collected at the end of a term/semester. **Workbooks have been phased out of the program with the exception of Drill and Ceremonies, and Unlocking Your Potential. When warehouse inventory is depleted these workbooks will no longer be available and will be deleted from the order form.** The instructor guides provide lesson objectives, samples of behavior, chapter and lesson overviews, teaching strategies, attention steps, lesson plans, activities, and answers to exercises found in the textbooks and student workbooks. STEM materials from Civil Air Patrol (CAP)
and other education partners are considered supplemental material and may be used in the classroom. To reinforce what is learned in the classroom, cadets participate in many CIA events such as field trips to military bases, aerospace facilities and industries, museums, civilian airports, etc. Cadets should also be participating in LDR activities such as parades, summer leadership schools, team competitions, military balls, honorary academic groups, and other community activities.

Permission has been granted by each commercial publisher used for AFJROTC courses to allow units to post all electronic files for those courses on _UNIT OR SCHOOL PASSWORD- PROTECTED SCHOOL PC's, LAPTOPS, TABLETS, WEBSITES, AS WELL AS COMMERCIAL SITES SUCH AS KAHOOT, GOOGLE CHROME, BLACKBOARD OR POWERSCHOOL_. These files may be accessed by enrolled cadets who possess or will possess the courseware that these companies sell the Holm Center for use in AFJROTC classrooms. Copyright rules allow instructors to copy selected pages from AFJROTC’s commercially produced courses to facilitate instruction in AFJROTC classrooms, but the copying of entire publications for distribution in lieu of using Air Force purchased material is **PROHIBITED** by US copyright law.

### CURRICULUM GUIDANCE

The point of contact for all AFJROTC curriculum issues is the Holm Center Academic Affairs Directorate, AFJROTC Curriculum Branch (DEJ). Per the Memorandum of Agreement, the AFJROTC curriculum provided by the Air Force must be taught at the host school. Courses receiving “elective” credit must use a 40%-40%-20% Curriculum Model for each semester of instruction. Units that receive “core” credit use a 60%-40% model for each semester.

AFJROTC courses should be coded in school catalogs as AFJROTC courses unless the individual school district requires AFJROTC courses to be coded in a particular manner. The course description should clearly indicate that the course is offered by the AFJROTC department and is for AFJROTC students only. Course descriptions should accurately describe course content being taught for each course offered.

Units are expected to teach AFJROTC course objectives and use the curriculum materials provided by Holm Center/DEJ. **TEXTBOOKS OTHER THAN THOSE PROVIDED BY HOLM CENTER ARE NOT AUTHORIZED AND CANNOT BE USED UNLESS PERMISSION IS GRANTED BY WAIVER.** This does not mean that teachers cannot use supporting materials (e.g., videos, exercises, games etc.) not provided by Holm Center/DEJ as long as those materials help the instructor accomplish the established course goals and objectives of the AFJROTC curriculum and are not more than 10% of the contact time allotted for teaching the course. Instructors choosing to include supplemental/supporting material to reinforce HQ’s provided curriculum should include this material when defining the unit course in WINGS. Supplemental/supporting material supporting Holm Center approved curriculum during daily classroom instruction exceeding 10% of the Unit Defined Course **MUST** be defined by going to WINGS | Menu | Unit Management | Curriculum | JROTC Unit Defined Curriculum. Supplemental/supporting materials **WILL NOT** exceed 10% of instruction time without a waiver approved by Holm Center/DEJ. Using non-AFJROTC support materials falls under the category of personalizing your lesson plans, which you are encouraged to do.

Units **MUST** use WINGS to maintain accountability for all curriculum materials and instructors **MUST** teach courses using current Aerospace Science and Leadership Education materials. Obsolete material must be disposed of IAW guidelines described in the Curriculum Guide and in AFJROTCI 36-2010.
Academic Program

AFJROTC is a three- or four-year program for high school students. The fourth year is available in schools that have ninth through twelfth grade. The curriculum includes Aerospace Science (AS), Leadership Education (LE) and Wellness. All students must be given credit towards graduation for successful completion of the AFJROTC academic year per the Air Force School Agreement. **Courses are designed for the cadet to complete one academic year of instruction in each grade level to meet Title 10 requirements.** Each academic course must consist of an AS component, LE/Drill component, and a Wellness component, except Core/Graduation Credit, Aviation Honors Ground School classes, and stand-alone drill courses. Cadets are expected to participate fully in the enrolled JROTC class; which includes attending all classes, wearing the uniform on designated uniform days, and participating in wellness/PT activities. Independent study for cadets enrolled in JROTC classes **MUST** be avoided. If AFJROTC courses are loaded on school websites, they **MUST** be password protected.

**Instructional Contact Hours**

The minimum contact hours provided in the MOA is intended to ensure contact hours meets Title X requirements for school schedules. Instructors are expected to teach Holm Center Approved curriculum for the entire school year / term. Outside curriculum exceeding 10% or additional outside classes must be approved by Holm Center Academic Affairs/DEJ (Curriculum Policy waiver) prior to adding any curriculum exceeding 10% or additional classes.

**Curriculum Waivers and Deviations**

Cadets cannot be assigned to Unit Defined Courses that indicate a waiver is required, red “X” in any of the five rule boxes. Units must submit a waiver request to Holm Center/DEJ “Curriculum Policy” through the Unit Defined Course if waiver is required prior to teaching the course. **IMPORTANT NOTE: A waiver required as indicated by a RED “X” MUST be submitted immediately!** If a waiver is needed prior to submitting PSR enrollment numbers, units **MUST** submit their waiver request prior to September 15th for the October PSR and January 15th for the February PSR. Waivers not submitted by these suspense dates may not be reviewed prior to the PSR suspense date.

**All waivers, regardless of subject, must be requested and approved in WINGS.** Units may be granted waivers to deviate or be exempt from policy (e.g., curriculum, ground school, health and wellness program, uniform, etc.). Units will submit all waiver requests to HQ using WINGS—**NO phone or email waivers will be accepted or considered.** All waiver requests received in a particular month will be reviewed and staffed to the proper approval authority by the end of the next month. As soon as the convening board reaches a decision, HQs will notify those units who requested a waiver/deviation whether request is approved/denied.

**NOTE: Curriculum policy waivers approved by Holm Center/DEJ remain valid for a period of 4 full academic years after the date of approval.**

Aerospace Science (AS)

AS acquaints students with the elements of aerospace and the aerospace environment. It introduces them to the principles of aircraft flight and navigation, the history of aviation, development of air power, contemporary aviation, human requirements of flight, cultural and global awareness, geography, the space environment, space programs, space technology, rocketry, propulsion, the aerospace industry, and survival.
Science, Technology, Engineering, and Math (STEM)

STEM is curriculum based subject areas designed for students to better understand science and math related curriculum, improve critical thinking skills, and to help cadets be competitive in the 21st century learning environment. AFJROTC has established partnerships with organizations such Air Force Association (AFA), Civil Air Patrol (CAP), National Association Rocketry (NAR), and Academy of Model Aeronautics (AMA) to include STEM opportunities with AS curriculum.

Holm Center Academic Affairs Directorate will be offering AS STEM courses to supplement, NOT replace Holm Center provided Aerospace Science curriculum. STEM utilization rules and full descriptions of each of the twelve offerings may be found on pages 126 through 141 of this guide.

Leadership Education (LE)

LE is the portion of the AFJROTC curriculum that develops leadership skills and acquaints students with the practical application of life skills. The leadership education curriculum emphasizes discipline, responsibility, leadership, followership, citizenship, customs and courtesies, cadet corps activities, study habits, time management, communication skills, career opportunities, life skills, financial literacy, management skills, and drill and ceremonies.

Leadership Education Electives (LE Electives)

Starting the 2015 – 2016 school year, Holm Center Academic Affairs Directorate provided a list of additional Leadership Education (LE) electives to allow more flexibility when Unit Defining Courses in WINGS. LE electives are intended to build upon Holm Center provided leadership education and skills development curriculum. LE elective content will be identified and listed in WINGS | Unit Management | Curriculum | JROTC HQ Provided Curriculum as an ELECTIVE1, ELECTIVE2, and so on.

LE Elective utilization rules and full descriptions of each offering may be found on page 200 of the curriculum guide and ordering information can be found on page 7 of the Curriculum, Materials, Publications, and Forms (CMPF) posted in WINGS | Published Files | Directory | JROTC | AFJROTC Curriculum.

Wellness Program

Wellness is an official and integral part of the Air Force Junior ROTC program. The objective of the Wellness/PT Program is to motivate cadets to lead healthy, active lifestyles beyond program requirements and into their adult lives. For classes awarding elective or PE credit for AFJROTC courses, 20% of available contact time must be devoted to Wellness/PT instruction. Units that cannot integrate Wellness/PT into their classes due to inadequate or inaccessible gym facilities, or other reasons, MUST submit a waiver request to WINGS | Unit Waivers | Health & Wellness. Units with core credit classes are encouraged to establish a Wellness/PT program for their cadets outside normal classroom hours or during zero, lunch or after school periods. Further guidance for AFJROTC Wellness/PT program is provided in the Curriculum Guide; descriptions for these exercises are located on WINGS | Published Files | Directory | JROTC | Wellness Program.

For schools awarding elective credit for AFJROTC courses, 40% of available contact time (contact hours) will focus on AS material, 40% on LE, and 20% on Wellness/PT. For units that award core credit such as science, history, geography, civics and government, or other core credit courses as defined by No Child Left Behind Act (NCLB), 60% of available contact time is to be spent teach-
ing AS material and 40% on LE (or 60% on LE and 40% on AS, depending upon which component justifies the core or graduation required credit). Courses such as PE, Career Technical Education (CTE), Life Skills, Health, Freshman Orientation, Financial Literacy, are considered state graduation requirements and are expected to meet the 40/40/20 curriculum division rule.

Units **MUST** submit a waiver request to Holm Center/DEJ identifying any required courses that will not include a Wellness component in order to warrant core credit. Instructors including state/district mandated material in order to receive core credit should include this material when defining the unit course in WINGS. Units receiving core graduation credit for courses are not to exceed 10% of outside/state mandated curriculum. Core graduation credit **MUST** be solely based on Holm Center provided curriculum. Required material included during daily classroom instruction that exceeds 10% of the Defined Course will be defined by going to WINGS | Menu | Unit Management | Curriculum |

**Additional guidance and Wellness Program exercise descriptions and standards can be found on page 191 of this guide.**

**Drill and Ceremonies (Drill Curriculum; Cumulative)**

Drill and Ceremonies is offered as a part of the Leadership Education content of a given course or can be taught as a zero hour class or as an after school co-curricular activity. When Drill and Ceremonies is offered as part of Leadership Education, the drill portion **MUST NOT** exceed 50% of the LE component. *Refer to page 46 of the curriculum guide for Unit Defined Course sample using Drill Curriculum, Cumulative.* If a cadet participates in Drill Team activities before or after school, they must also be enrolled in an AS/LE/WELL course to be counted as part of the unit’s AFJROTC enrollment.

**NOTE:** Additional guidance for Drill Only and other LDR Only classes can be found on page 63.

**Aviation Honors Ground School**

Aviation Honors Ground School (AHGS) is taught as the AS component of an AFJROTC course replacing other AS curriculum for third- and fourth-year cadets only. AHGS should be taught as an “Honors” class, when honors credit is awarded, instructors may define this course in WINGS using the 60%-40% AS/LE mix. Enrollment is open to deserving third- and fourth-year honor students the AFJROTC instructor determines has earned the opportunity to take the course. When the course receives “Honors” (e.g., advanced) credit, it **MUST** have principal approval. Course goal is for students receive honors level credit on transcript and/or be prepared to take and pass the Federal Aviation Administration (FAA) written examination per requirement of the Federal Aviation Regulations CFR 61-102, Sections 61.103 & 61.105. Upon receiving a passing score on the FAA Private Pilot’s Knowledge Exam, the instructor may request Ground School badges from HQ Holm Center/JROL.

AHGS should only be taught by AFJROTC instructors who hold appropriate Ground School Instructor (AGI or BGI), FAA Certified Flight Instructor (CFI) certificates, or Air Force Form 8’s indicating extensive aircrew instructor/evaluator experience. Instructors interested in offering an AHGS course must submit request through WINGS | Unit Management | Define Unit Course | Request content waiver for this course | Submit. Please ensure supporting documents (FAA certificates or AF Form 8’s) are attached prior to submitting waiver request. Waiver approval will be dependent upon Air Force flying or related experience. After gaining approval, units may order the ground school materials at: WINGS | Menu | Logistics | Create/Display Orders | Create Order | Order | Search for Items | Category (Curriculum) | Subcategory (Ground School).
NOTE: AHGS instructors who do not hold a AGI/BGI or CFI certification will be required to have a AGI/BGI or CFI certified instructor sign-off that course meets FAA standards before cadets may take the FAA administered exam.

Aviation Honors Ground School Prerequisite
Holm Center/DEJ requires units approved to teach Aviation Honors Ground School to teach AS-200: The Science of Flight: A Gateway to New Horizons as a prerequisite to the ground school course. Waivers will be considered for high academic achieving cadets who have not taken AS 200 prior to enrolling in an AHGS course and must be approved via waiver prior to enrollment. Additional guidance for the AHGS may be found on page 114 of this guide.

AFJROTC Honors Senior Project
This culminating (capstone) honors project is designed for cadets to demonstrate essential skills through reading, writing, speaking, production, and/or performance. Skills in analysis, logic, and creativity will also be showcased through successful completion of this project.
The Honors Project is primarily targeted for senior cadets in a three- or four-year program. However, it is not uncommon for other academically successful cadets enrolled in Advanced Placement, Honors, or in an International Baccalaureate programs to successfully complete this project. In order to retain these cadets in the unit’s AFJROTC program and to continue to improve their critical thinking and research skills, selected cadets with demonstrated academic capabilities may also enroll in this class with SASI approval. The honors project may be used as an Aerospace Science (AS) substitution and taught as a 60%/40% curriculum mix when the following conditions are met:
- Course must receive Honors level credit from the school or district.
- Subject area for project MUST come from HQ's provided curriculum. AS or LE curriculum.
- Contact time cannot exceed 36 hours, or one semester equivalent.
- Course must have a LE/Drill component.

All materials including the grading rubric for the Honors Project is posted in WINGS | Menu | Published Files | Directory | JROTC | AFJROTC Curriculum | Honors Project.

Career Technical Education (CTE)
Career and technical education is a term applied to schools, institutions, and educational programs that specialize in the skilled trades, applied sciences, modern technologies, and career preparation. CTE today is what many instructors remember as vocational education, a term no longer used. Currently, the US Department of Education recognizes 16 Career Clusters. These 16 career clusters are occupational categories with industry-validated knowledge and skills statements that define what cadets need to know and be able to do in order to realize success in a chosen field. Within each of these clusters, programs of study (career pathways) have been developed, which outline sequence of academic, career, and technical courses and training that begin as early as ninth grade and lead to progressively higher levels of education and higher-skilled positions. AFJROTC normally does not offer what is termed an “Industry Certificate” such as Agriculture, Automotive, and Welding pathways of study. The best fit for AFJROTC programs is in the “Government and Public Administration” cluster. Through JROTC cadets learn employability (soft) skills needed in today's and future workforce environments.

CTE offers cadets an opportunity to earn graduation credit while employing the followership,
leadership, communication, citizenship, and discipline skills they have developed while in JROTC. Cadets completing “industry certificated” courses of study also earn CTE credit, these include Aviation Honors Ground School and Unmanned Aerial Systems when the cadet successfully passes the FAA examination.

Instructors are encouraged to further explore what CTE credit can offer your cadets through discussion with your county/district CTE administrator. Additional resources for CTE description, policies, standards, resources may be found at the following website: https://careertech.org/

Documentation that may benefit AFJROTC programs pursuing CTE will be posted in:

WINGS | Published Files | Directory | JROTC | AFJROTC Curriculum | Career Technical Education

CTE Restrictions

As with earning other core/graduation credit, any CTE credit earned must be based on Holm Center provided curriculum unless a waiver has been granted. Earning CTE credit must not violate the agreed upon and signed MOA between HQ’s AFJROTC and the school district. These include but are not limited to the following:

1. SASI must maintain Department Chair status.
2. AFJROTC must maintain its separate and equal department status.
3. Holm Center approved curriculum must be taught at all times unless a waiver has been granted.
4. All students taught by AFJROTC instructors must be enrolled in JROTC, no exceptions.
5. Cadets WILL NOT be compelled to take the ASVAB CEP as part of the AFJROTC curriculum or end of course/completer assessment. Refer to Directors Policy Letter posted in:


Dual-Enrollment Course Opportunities

Dual-enrollment courses have become an excellent way for qualifying students to explore an opportunity to earn college credit while still in high school. Many Air Force JROTC units have taken the opportunity to create dual-enrollment agreements with local community colleges. By participating in these programs with local community colleges, cadets can earn college level credit while meeting high school graduation requirements. Instructors are encouraged to seek out these local opportunities.

Many four-year universities are also offering dual-enrollment course opportunities for JROTC. Embry-Riddle Aeronautical University (ERAU) World Wide campus and Gaetz Aerospace Institute are creating these same opportunities for qualified instructors and cadets. The advantage of ERAU’s World Wide and Gaetz Institute dual-enrollment offerings is that a qualifying instructor is considered and adjunct professor, keeping the cadet in class and not losing them to an off-campus program.

- Instructors interested in creating dual-enrollment courses must keep in mind that these opportunities are not for every cadet. These are college level courses, and some dual-enrollment programs have established minimum GPA requirements. If not, cadet overall GPA must be considered prior to enrollment.
- Dual-enrollment courses taught by JROTC instructors are for JROTC cadets ONLY! A student must be enrolled in JROTC to be taught by a JROTC instructor.
• JROTC instructors will be required to establish separate classes for dual-enrollment courses, blended courses will not be offered in the same class. **Independent study is not permitted.**

• Dual-enrollment courses **WILL NOT** be offered as an online course unless approved through curriculum policy waiver.

### Blended Courses

Blended courses are permitted, however, instructors **MUST** ensure that no content is offered as an independent study option. A *blended course* is defined as a course that combines lessons from two or more authorized AFJROTC courses into one course. For example, a blended Aerospace Science course may contain lessons from *Exploring Space: The High Frontier,* *The Science of Flight: A Gateway to New Horizons,* and *Cultural Studies: An Introduction to Global Awareness,* all taught in the same academic year, or in the case of block/trimester schedules, during the same term. The Leadership Education portion may consist of portions from LE 100, LE 200, LE 300 and/or LE 400.

### Blended Classes

Blended classes are also permitted. Blended classes are defined as scheduled classes that may contain 9th, 10th, 11th, or 12th graders all in the same class. These blended classes offer the opportunity to consolidate curriculum instruction such teaching all cadets the same curriculum each year. **Restriction: AS 400: Management of the Cadet Corps is reserved for cadet corps staff members; instructors MUST ensure only cadet corps staff members take this course.** Please refer to further guidance for AS 400 on page 100 of the Curriculum Guide. Repeating curriculum material is not authorized for these blended classes IAW AFJROTCI 36-2001.

Blended classes in which first-year cadets are enrolled will obviously have to contain portions of the LE 100 curriculum such as chapter one to teach the fundamentals of the AFJROTC program or provisions may be made to offer the LE 100 curriculum separately to those cadets. **Refer to Sample Seven-Year Curriculum Plan posted in WINGS | Published Files | Directory | JROTC | AFJROTC Curriculum | Curriculum Guide** for schedule examples.

### Current Curriculum Materials

Current copies of the Curriculum Materials, Publications, and Forms (CMPF) document and the Curriculum Guide can be found in the WINGS | Menu | Published Files | Directory | JROTC | AFJROTC Curriculum | CMPF. **Hard copy Curriculum Guides are no longer provided.**

Instructors must teach from current curriculum materials as defined in this guide and the CMPF. Instructors not teaching from current curriculum materials during the Regional Director’s visits must provide documentation or waiver showing that current materials were not available in time for instructor preparation and use before the current term began. Videos that are removed from the CMPF list and/or WINGS | Menu | Logistics | Inventory will remain authorized for use in the classroom at the units, as long as they remain relevant and are serviceable. Curriculum material inventory must be maintained in WINGS | Logistics to ensure proper accountability of all items.
Course Offerings
All units have the option to determine which aerospace science and leadership education courses to offer to first-, second-, third- and fourth-year cadets. The options to select from are:

Aerospace Science
- AS 100: Milestones Aviation History Second Edition
- AS 220: Cultural Studies: An Introduction to Global Awareness
- AS 300: Exploring Space: The High Frontier
- AS 400: Management of the Cadet Corps
- AS 410: Survival: Survive • Return
- AS 500: Aviation Honors Ground School
- AS 510: AFJROTC Honors Senior Project
- AS STEM 1: Unmanned Aerial Vehicles (UAVs)/Quadcopters
- AS STEM 2: Model and Remote Control Aircraft
- AS STEM 3: Weather Station “Air Environment”
- AS STEM 4: Astronomy
- AS STEM 5: Flight Simulator
- AS STEM 6: StellarXplorers
- AS STEM 7: CyberPatriot
- AS STEM 8: Introduction to CyberSecurity
- AS STEM 9: Cyber Literacy
- AS STEM 10: Introduction to Robotics
- AS STEM 11: Model Rocketry (Basic)
- AS STEM 12: Model Rocketry (Advanced)

Leadership Education
- LE 100: Traditions, Wellness, and Foundations of Citizenship
- LE 200: Communication, Awareness, and Leadership; Second Edition
- LE 300: Life Skills and Career Opportunities
- LE 400: Principles of Management
- Drill Curriculum (Cumulative)
- ELECTIVE1: Unlocking Your Potential (UYP)
- ELECTIVE2: National Endowment for Financial Literacy (NEFE)
- ELECTIVE3: Congressional Medal of Honor Foundation (MHF)
- ELECTIVE4: Pennsylvania Veterans Museum (PVM)
- ELECTIVE5: Veterans National Education Program (VNEP)
- ELECTIVE6: Cadet Guide/Handbook
- ELECTIVE7: College Options SAT/ACT Prep
- ELECTIVE8: Financial Readiness
It is possible for units on non-traditional schedules (4x4 Block) teaching the AFJROTC basic courses to have cadets complete the program in 2 years. Cadets completing the JROTC program in 2 years is not recommended and should not be encouraged. The creation of blended courses and extending the contact time for course chapters/lessons will allow units to create more course options allowing cadets to remain 3 or 4 years in the program.

However, instructors **MUST** ensure the amount of material taught adequately covers the textbook. In other words, instructors teaching one lesson or chapter for the entire school year or term is unacceptable.

When selecting the courses units will offer in any given academic term, instructors should keep in mind the reading levels of the cadets. The higher the AS or LE course number, the higher the reading level designed for that particular course. Many lower reading level students will have difficulty reading and comprehending some of the upper level material such as the *Exploring Space: The High Frontier* course. New units are encouraged to offer **AS-100: Milestones in Aviation History** and **LE-100: Traditions, Wellness, and Foundations of Citizenship** to all first-time cadets and that all units always teach these two courses first to their first-time enrolled cadets.

Units may wish to group first-, second-, third- and/or fourth-year cadets in the same AS and LE course to reduce scheduling issues and to take advantage of the mentoring potential provided by upper level cadets. If this option is chosen, instructors must ensure the same aero-space science and leadership education courses are not offered in successive years. Over a period of three or four years, cadets must receive different AS and LE courses and be precluded from signing up for the same course twice during their years in AFJROTC.
Outdated (Obsolete) Curriculum Materials

The following curriculum materials are outdated and **NO LONGER AUTHORIZED** to be taught or added as content for any Unit Defined Course:

**Aerospace Science**
- Aerospace Science: A Journey into Aviation History 2007
- Aerospace Science: Policy and Organization 2001
- Aerospace Science: Global and Cultural Studies (Volumes 1 & 2) 2006
- Aerospace Science: The Exploration of Space 2003
- Aerospace Science: The Exploration of Space, Second Edition 2005
- Explorations: An Introduction to Astronomy 2004

**Leadership Education**
- **LE 200**: Communication, Awareness, and Leadership 2006
- ***Leadership Education 500** (Replaced by Drill Curriculum, Cumulative) 2010
- Leadership Education I: Citizenship, Character, and Air Force Tradition 2005
- Leadership Education III: Life Skills and Career Opportunities 2006
- Leadership Education IV: Principles of Management 1999

*NOTE: Effective FALL 2019 all units must be teaching AS 100 (2016) second edition.*

**NOTE: Effective FALL 2018 all units must be teaching LE 200 (2017) second edition.**

***NOTE: Leadership 500: Drill & Ceremonies will no longer be used to define unit courses. Instructors will use Drill Curriculum, Cumulative in place of LE 500.***

NOTE: Outdated and obsolete curriculum **WILL NOT** be retained as reference material. Outdated instructor guides may be retained but must be listed in WINGS curriculum inventory.

Disposal of Outdated and Obsolete Curriculum Materials

Outdated and obsolete curriculum materials will be disposed of via one of the options listed below. No specific documentation is required when these disposal actions are taken, since only obsolete materials are to be dispensed of in accordance with this policy. However, since these items may be loaded in unit WINGS inventory, a write-off action must be taken to show the loss.

1. Donate to the host school library or another academic department
2. Donate to any public or private school library
3. Donate to a home-schooled student
4. Donate to a Civil Air Patrol unit, the Boy Scouts, Girl Scouts, alternative schools or any other youth services, character development or public service agency
5. Donate to another public or private high school
6. Donate to any other publicly funded entity
7. Recycle via a local recycling program (does not include landfill disposal)
8. Dispose of obsolete or unserviceable curriculum using the schools disposal method
9. **Outdated and obsolete curriculum WILL NOT be retained as reference material.** Outdated instructor guides may be retained but must be listed in WINGS curriculum inventory.
If a student loses curriculum material and a fee is collected, fees must be returned to the Holm Center Support Directorate, Financial Management Branch (SDF), 130 West Maxwell BLVD, Maxwell AFB, AL 26112-6106, within 30 days after payment is collected. These fees cannot be deposited into host school financial accounts or used by JROTC units or associated support groups/booster accounts, since property provided by the federal government cannot be transferred to state or local agencies via this means. Additionally, federally provided items cannot be lawfully sold to outside entities, including book stores or other commercial agents who may use the material for financial gain.

If the curriculum materials are damaged or destroyed due to a fire, flood, or other natural disaster (e.g., hurricane, tornado, earthquake, etc.), the school cannot claim these items on their school insurance policy since the materials were obtained by the US Air Force with government funds.

**Disposal of Unusable Portable Curriculum Hard Drives (PHD)**

PHD’s **MUST** now be added to your unit AIM account, Holm Center/DEJ will no longer accept broken or non-working PHD’s sent back to our office. PHD’s that are not working may be disposed of by destroying the hard drive. In order to be removed from your AIM account it must be properly disposed of or transferred. Contact your regional ECO for proper disposition and/or transfer of IT equipment. Additional information for disposal of PHD and other AIM equipment can be found at: [http://www.au.af.mil/au/holmcenter/AFJROTC/AIMInv_Information.asp](http://www.au.af.mil/au/holmcenter/AFJROTC/AIMInv_Information.asp)

**NOTE:** Portable Hard Drives are **NOT** being replaced at this time. If the PHD becomes inoperative, units must properly dispose of PHD
The AFJROTC curriculum is the result of an extensive and continuous review using the Instructional System Development (ISD) process. ISD is a deliberate and orderly, but flexible process for planning, developing, implementing, and managing instructional systems. It ensures that personnel are taught in a cost-efficient way the knowledge, skills, and attitudes (KSAs) essential for successful performance.

### Instructional System Development Process

The process involves instructional systems specialists, teachers, leadership, independent researchers, and evaluators from the academic and military environments. The ISD process requires instructional specialists to analyze and determine what instruction is needed, design instruction to meet the need, develop instructional materials to support system requirements, so teachers can implement the instructional system. During the process, evaluation is a central function that takes place in each phase. This model is similar to the ADDIE model: Analyze, Design, Develop, Implement, and Evaluate.

The ISD model represents simplicity and flexibility so instructional system specialists can use it to develop effective, efficient instructional systems. The model depicts the flexibility that instructional developers have to enter or reenter the various stages of the process as necessary. Entry or reentry into a particular stage of the process is determined by the nature and scope of the development, update or revision activity.

![Air Force ISD Model](image-url)
System Functions

The system functions of the ISD model are:

- **Management** - The function of directing, controlling instructional system development and operations.
- **Support** - The function of maintaining all parts of the system.
- **Administration** - The function of day-to-day processing and record keeping.
- **Delivery** - The function of bringing instruction to students.
- **Evaluation** - The function of gathering feedback data through formative, summative, and operational evaluations to assess system and student performance.

Using these essential functions to design the overall instructional system and then allocating them to the respective instructional system components, or people responsible, ensures that these functions are operational when the total training system is used. ISD products are integrated into the total instructional system, and aspects of the instructional system functions are active throughout all phases of the ISD process.

The model shows the phases used in the systems approach, which are analysis, design, development, and implementation, with the evaluation activities integrated into each phase of the process. The phases are embedded within the system functions. Evaluation is shown as the central feedback "network" for the total system.

**ISD Phases**

The instructional development process enables the collaborators to:

- **Analyze** and determine what instruction is needed.
- **Design** instruction to meet the need.
- **Develop** instructional materials to support system requirements.
- **Implement** the instructional system.

**Evaluation is a central function that takes place at every phase.**

- **Analysis Phase** – In this first phase, it is determined what students need to know and do to meet course requirements and national, state, and/or district standards as applicable. Course tasks are analyzed and compared with the skills, knowledge, and abilities of the incoming students. Many of the requirements for Junior ROTC were reviewed by the U.S. Congress and specified in General Military Law, USC Title 10, Chapter 102. This law sets the tasks/functions and identifies job components.

- **Design Phase** – Instructional objectives/outcomes and tests are created and the instruction is designed. A detailed plan of instruction is developed and includes selecting the instructional methods and media, and determining the instructional strategies. Existing instructional materials are reviewed during this phase to determine their applicability to the specific instruction under development.

- **Development Phase** - Both the student and instructor lesson materials are developed. These include media such as video segments, interactive courseware (ICW), and training devices.
• **Implementation Phase** - The instructional system has been designed and developed, and it is now time for the actual system to become operational. In this phase, the instructional system is fielded used by the teachers.

**Evaluation** is a continuous process beginning during the analysis phase and continuing throughout the life cycle of the total instructional system. Evaluation consists of:

- **Formative Evaluation** consists of process and product evaluations conducted during the analysis and design phases, and validation is conducted during the development phase. Included are individual and small group tryouts.
- **Summative Evaluation** consists of operational tryouts conducted as the last step of validation in the development phase.
- **Operational Evaluation** consists of periodic internal and external evaluation of the operational system during the implementation phase.

Each form of evaluation should be used during development, update, and revision of instruction, if possible, and if the form of evaluation is applicable.

**Writing Student-Centered Objectives and Tests**

When deciding what to teach and how to measure success in the teaching environment, there are many things to determine in the lesson-planning process. These include who our students are, what they will need to know, how we will present the material to them, and what our students will be able to do once they have received and processed the information we present. To do this, it is important to write student-centered objectives and tests that focus on the abilities we want the students to display after having received the instruction. With student-centered objectives and tests, teachers are better able to plan teaching activities designed to efficiently impart and display the knowledge we want the students to learn.

**Planning for Student-Centered Outcomes**

Since the 1950’s, there has been a movement within civilian and military education to promote student-centered instruction through the use of appropriate objectives. As a result, student-centered objectives that describe learning in terms of student outcomes versus instructor inputs have been used for over four generations of education.

With the continued push for accountability in schools, the trend toward student-centered instruction is sure to continue. We have found that this approach is “results driven,” goal oriented, and client centered. It is so much more effective in meeting our educational goals that it is the standard. Moreover, since student learning is defined in terms of objectives, our measurement of success in instructing is now based on comparing student performance to the objectives rather than on comparing students to each other in a given class. Hence, we have a more accurate, objective, and stable foundation on which to make academic judgments about our students and predictions of their future success.

**Domains of Learning and Learning Taxonomies**

Learning may be defined as a change in behavior based on instruction. Students should perform differently after receiving instruction. Moreover, if we have used student-centered objectives, that behavior should be what we predicted it would be.
Domains of Learning

Learning takes place within one or more of the domains of learning: the cognitive domain (knowledge/thinking), the affective domain (attitude/feeling), and the psychomotor domain (skills/doing). There are different learning taxonomies—classification systems—for each of these domains. Each taxonomy is divided into sub-categories ranging from the simplest to the most complex. These educational taxonomies are used when writing objectives and help instructors classify student-learning outcomes.

The Cognitive Domain Taxonomy by Bloom¹

The cognitive taxonomy of Dr. Benjamin Bloom is used as a frame of reference to plan instruction and to give us a better understanding of the range of possible cognitive learning outcomes. By using this taxonomy, or classification of learning outcomes, we will carefully specify behaviors that will give us reasonable evidence of learning at the various levels of knowledge and understanding.

Cognitive Taxonomy by Bloom

<table>
<thead>
<tr>
<th>Levels/Categories</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation</td>
<td>• Judging the value of material for a given purpose</td>
</tr>
<tr>
<td>Synthesis</td>
<td>• Assembling parts together to form new patterns or structures</td>
</tr>
<tr>
<td>Analysis</td>
<td>• Breaking down material into parts</td>
</tr>
<tr>
<td>Application</td>
<td>• Using learned material in new situations</td>
</tr>
<tr>
<td>Comprehension</td>
<td>• Understanding (translation, interpretation, extrapolation)</td>
</tr>
<tr>
<td>Knowledge</td>
<td>• Remembering/recall of specifics</td>
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</tbody>
</table>


The Revised Bloom’s Taxonomy²

The Revised Bloom’s provides a more authentic tool for curriculum design, teaching and learning processes, and assessment. It focuses on outcome-based objectives, which forms the basis for content, delivery, activities, and assessments. The categories (levels of learning) changed from nouns to active verbs, since thinking is an active process. In addition, three of the six categories were renamed, and the highest two were rearranged. For example, “knowledge” became “remember” and “comprehension” became “understand.” The categories are: remember, understand, apply, analyze, evaluate, and create.
Revised Bloom’s Taxonomy

<table>
<thead>
<tr>
<th>Levels/Categories</th>
<th>Definitions and Cognitive Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original</strong></td>
<td><strong>Revised</strong></td>
</tr>
<tr>
<td>Evaluation</td>
<td>Create</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Evaluate</td>
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<tr>
<td>Analysis</td>
<td>Analyze</td>
</tr>
<tr>
<td>Application</td>
<td>Apply</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Understand</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Remember</td>
</tr>
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</table>

- **Evaluation**: Put elements together to form a coherent or functional whole; reorganize elements into a new pattern of structure (generating, planning, producing)
- **Synthesis**: Make judgments based on criteria and standards (checking, critiquing)
- **Analysis**: Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose (differentiating, organizing, attributing)
- **Application**: Carry out or use a procedure in a given situation (executing, implementing)
- **Comprehension**: Construct meaning from instructional messages, including oral, written, and graphic communication (interpreting, exemplifying, classifying, summarizing, inferring, comparing, explaining)
- **Knowledge**: Retrieve relevant knowledge from longterm memory (recognizing, recalling)


The Affective Domain Taxonomy by Krathwohl

A similar scheme for specifying attitudinal objectives was developed by Dr. David R. Krathwohl. Like the Bloom taxonomy, Krathwohl attempted to arrange attitudinal objectives in an order of difficulty. Behavioral evidence is attached to the various levels of this taxonomy for purposes of measurement.

<table>
<thead>
<tr>
<th>Levels/Categories</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characterization</td>
<td>• Incorporates value into life style</td>
</tr>
<tr>
<td>Organization</td>
<td>• Relating to other values</td>
</tr>
<tr>
<td>Valuing</td>
<td>• Acceptance with developing commitment</td>
</tr>
<tr>
<td>Responding</td>
<td>• Willingness to act</td>
</tr>
<tr>
<td>Receiving</td>
<td>• Awareness and attention</td>
</tr>
</tbody>
</table>

The Psychomotor Domain by Simpson

Elizabeth Simpson created the psychomotor domain taxonomy; it includes physical movement, coordination, and the use of motor-skills areas and deals with the development of physical tasks. Students’ success in learning is assessed by having them complete an evaluation that demonstrates the same physical or mental skill described in the objective.

Psychomotor Taxonomy by Simpson

<table>
<thead>
<tr>
<th>Levels/Categories</th>
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<tbody>
<tr>
<td>Origination</td>
<td>• Creating new movement pattern</td>
</tr>
<tr>
<td>Adaptation</td>
<td>• Modifying motor actions to fit changing situations</td>
</tr>
<tr>
<td>Complex Overt Response</td>
<td>• Performance involves controlled accuracy</td>
</tr>
<tr>
<td>Mechanism</td>
<td>• Actions are habitual and performed with confidence</td>
</tr>
<tr>
<td>Guided Response</td>
<td>• Overt imitation of instructor’s actions</td>
</tr>
<tr>
<td>Set</td>
<td>• Readiness to perform motor action</td>
</tr>
<tr>
<td>Perception</td>
<td>• Focuses all senses to guide motor action</td>
</tr>
</tbody>
</table>


Develop Lesson Objectives

Lesson Objectives and Indicators/Samples of Behavior

It is usually helpful to plan learning systems with a general-to-specific strategy; that is, by starting with general objectives (referred to as “outcomes” in some environments) and ending with very precise performances. By writing general, carefully developed, non-behavioral objectives or outcomes as the first step in planning, we are better able to describe the general type of behavior to look for from our students. It is very important to decide the level of learning before we attempt to describe its evidence by precise behavior. In each course, the level of learning is illustrated using the verbs from Bloom’s cognitive domain.

After we have carefully communicated the level of learning we want our students to reach, we must decide which student behaviors we will accept as evidence of learning. The more specific samples of behavior (SOB) are observable and measurable behavioral indicators that help us determine if the student has achieved our general learning objective. Because we cannot “see” comprehend, we use samplings of behavioral indicators to measure our instructional success.

We can define a sample of behavior as a statement that specifies one of several measurable, observable, reliable, and verifiable behaviors that students should be able to demonstrate at the end of a period or block of instruction and which gives us significant evidence they have achieved our objectives. These samples begin with an action verb and eventually become the basis for our evaluation, most often in the form of test items.
Certain behavioral verbs lend themselves for use at each level of the taxonomy. However, the same verb may be used at different levels of the taxonomy depending on the context. The verb must reflect an observable behavior and the same level of learning as specified in the objective or outcome. If the sample is written at a higher or lower level, it will invalidate the effort to assess achievement of the objective at the specified level.

Here are some related action verbs based on the “Revised Bloom’s” Taxonomy:

<table>
<thead>
<tr>
<th>Levels of Learning</th>
<th>Related Action Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remember</td>
<td>Define, describe, find, identify, label, list, locate, match, name, outline, recall, relate, select, state, tell, write</td>
</tr>
<tr>
<td>Understand</td>
<td>Compare, contrast, describe, discuss, explain, generalize, give examples, identify, outline, paraphrase, predict, recognize, research, restate, summarize, translate</td>
</tr>
<tr>
<td>Apply</td>
<td>Classify, complete, compute, construct, demonstrate, examine, illustrate, manipulate, modify, operate, practice, prepare, sequence, show, solve, use</td>
</tr>
<tr>
<td>Analyze</td>
<td>Categorize, characterize, classify, compare, contrast, correlate, debate, determine, differentiate, distinguish, examine, explain, identify, investigate, research, sequence</td>
</tr>
<tr>
<td>Evaluate</td>
<td>Appraise, assess, choose, decide, debate, discriminate, judge, justify, rate, recommend, prioritize, score, select, value</td>
</tr>
<tr>
<td>Create</td>
<td>Compose, construct, design, develop, formulate, generate, hypothesize, imagine, invent, plan, predict, prepare, produce, set up</td>
</tr>
</tbody>
</table>

**Criterion-Referenced Objectives**

The criterion-referenced objective (CRO), on the other hand, is found extensively in training environments. In this environment, students are usually learning a task they must perform. The CRO, when written as a performance, condition, and standard, is inherently observable and measurable. Both the indicator/SOB and the CRO are attempting to define the behavior we expect from the student once the instruction is complete. The SOB is taking a cognitive and/or affective outcome and making it observable and measurable while the CRO is defining the expectations of the student while performing a specific task under specified conditions.

The difference between an SOB and a criterion objective is that the CRO is more specific and detailed and usually states the standards and conditions. However, a comprehensively written SOB may contain all the elements of a criterion objective. Also, a simple criterion objective may read like an SOB if either or both of the conditions or standards are assumed. Rather than split hairs about where the SOB leaves off and the criterion objective begins, remember that the SOB generally contains only a statement of performance. The criterion objective generally goes into more detail by adding standards and conditions to the performance statements.

The essential elements of a criterion objective include:

- **Conditions**: A description of the testing environment including those problems, materials, and supplies that will be given (included) or specifically excluded from a measurement situation.
- **Performance**: The observable student behavior (or the product of that behavior) acceptable to the instructor as proof that learning has occurred.
- **Standards**: The qualitative and quantitative criteria against which student performance or the product of that performance will be measured to determine successful learning.
A Comparison of Indicators/Samples of Behavior and Criterion Objectives:

<table>
<thead>
<tr>
<th>Illustrative Samples of Behavior</th>
<th>Interpreted as a Criterion Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define...(insert term)</td>
<td>Without the use of references, define...according to AFM xx-xxx. (remember)</td>
</tr>
<tr>
<td>2. Give an example of...(insert concept)</td>
<td>Given the concept of...as developed in class, give new examples of (insert concept) consistent with its attributes. (understand)</td>
</tr>
<tr>
<td>3. Prepare a position paper on… (insert subject)</td>
<td>Using resources, local experts, and a topic assigned from the area of..., prepare a position paper which meets the content and format standards provided in class and in the assigned text. (apply)</td>
</tr>
</tbody>
</table>

**Develop Criterion Tests**

The lesson-planning process concludes with the construction of test items and tests to measure learning. At this point, we construct test items from indicators or samples of behavior to measure our objectives. These test items are one method we use to gather evidence that students have learned what we intended them to learn. Test items are written prior to instruction because we will use these requirements to determine what needs to be taught. The support material in the lesson should enable the student to perform the indicators or samples of behavior.

The practice of measuring the achievement of stated objectives—known as criterion-referenced testing—is a rigorous process, and used to assess student-centered objectives. The following provides an example of the process for writing student-centered test items.

1. **Determine the Lesson Objective:** Know the meaning of leadership.

2. **List the Sample/Indicator of Behavior:** Identify the definition of leadership.

3. **Develop Criterion-Referenced Test Item:** Leadership is defined as:
   a. The willingness to exercise management control over subordinates.
   b. The ability to lead a group in a working environment.
   c. The process of inspiring effective individual effort in a group environment toward achieving an objective.
   d. Planning, organizing, staffing, directing, and controlling the capital, material, and human resources of an organization.
Types of Test Items

Written tests are the most frequently used means of measuring how well students achieve learning objectives. Here are some suggestions for preparing test items:

1. Keep the wording simple and direct.
2. Avoid tricky or leading questions.
3. Keep all items independent of other items on the test.
4. Crucial words or phrases in the stem should be underlined, capitalized, italicized, or otherwise highlighted. If possible, avoid negatives because they are often missed.
5. Include sketches, diagrams, or pictures when these will present information to the student more clearly than words.

Selection Test Items

Selection test items require students to select the correct response from a list of responses. Multiple-choice, true-false, and matching are examples of selection items.

Advantages:

1. Since students only have to identify the correct answer, two or more people can score selection items without letting personal bias or opinions affect the result.
2. Selection items take comparatively little time to answer. Students only have to read the item and choose between the responses provided rather than write out their answers.
3. Selection items can be readily analyzed statistically. Since answers to selection items are either right or wrong, statistical analysis is relatively easy.

Disadvantage:

A distinct disadvantage of selection test questions is the possibility of successful guessing. Students have a 50% chance of correctly answering true-false items and about a 25 to 33% chance (depending on the number of choices) of answering multiple-choice items correctly.

Multiple-Choice Items. The multiple-choice item can be used to measure student achievement and works equally well when a test problem has one correct answer or one best answer from an assortment of plausible answers. Certain standard terms are used in the construction of multiple-choice items. The preliminary sentence that poses the question or states the situation is known as the “stem.” Possible answers that can be selected by the students are known as “alternatives.” The correct answer is the “keyed response,” and incorrect answers are called “distracters.” Distracters are designed to attract less-informed students away from the correct answer.

Tips for Preparing the Stem of a Multiple-Choice Item:

1. Write the stem so it clearly represents the central problem or idea. The function of the stem is to set the stage for alternatives.
2. Only place the material in the stem relevant to the idea or to the solution of the problem unless selection of relevant material is part of the problem.
3. Make sure the stem does not reveal the correct response. Avoid clue words or phrases.
4. Include language in the stem common to all alternatives to avoid repetitious wording and to save reading time for the student.
5. Avoid any wording unnecessary to answer the question.
6. Avoid negative statements whenever possible because they often confuse the student.
7. Exercise caution when using the articles “a” or “an” at the end of the stem. These articles may reveal the correct response if all alternatives do not conform grammatically to the stem.

**Tips for Preparing the Alternatives of a Multiple-Choice Item:**

1. Avoid clue words such words as “all,” “always,” “never,” “usually,” and “sometimes.”
2. Make sure all alternatives are approximately the same length; longer statements in the correct alternatives may be a clue to the correct answer.
3. When alternatives are numbers, list them in ascending or descending order.
4. Make all alternatives plausible.
5. Place correct alternatives in random positions throughout the total test.
6. Avoid using the alternative “all of the above” and/or “none of the above.” If you must use them, be extremely cautious.

**True-False Items.** The true-false test items are useful in testing knowledge of facts, especially when there is little question whether a statement about a fact is either right or wrong. True-False items may also be used to determine the persistence of popular misconceptions when the suggestion of a correct response in a multiple-choice item would be too obvious. The chief disadvantage of the true-false item is that the possibility of correct guessing, particularly in simple items, is greater than in any other type of selection test item.

**Tips for Preparing True-False Items:**

1. Do not make part of a statement true and another part false.
2. Avoid the use of negatives. They confuse the reader.
3. Avoid involved statements. Keep wording and sentence structure as simple as possible. Make statements clear and definite.
4. Whenever possible, use terms that mean the same thing to all students and write short, simple statements.
5. As a rule, avoid absolutes, such as “all,” “every,” “only,” “no,” and “never.” Similarly, avoid statements containing “some,” “any,” and “generally.”
6. Avoid patterns in the sequence of responses because students can often identify sequence patterns.
7. Make statements brief and uniform rather than writing true statements longer than false statements.

**Matching Items.** The matching test item, with several variations, presents many of the advantages of the multiple-choice item. It is particularly useful in measuring understanding of closely related concepts or facts. The matching item is actually a collection of related multiple-choice items. Thus, the matching format provides a more compact form for measuring the same learning and can allow the more efficient use of testing time.

**Tips for Preparing Matching Items:**

1. Give specific and complete instructions. Do not make students guess what is expected of them.
2. Test only essential information; never test for unimportant details.
3. Use closely related materials throughout an item. When students can divide the set of alternatives into distinct groups, the item is reduced to several multiple-choice test items with just a few alternatives. This increases the possibility of guessing the correct answer.
4. To minimize guessing by elimination, make all alternatives plausible.
5. Arrange the alternatives in some logical order. An alphabetical arrangement is common.
6. If alternatives are not to be used more than once, provide three or four extra to reduce guessing.

**Supply Test Items/Open Ended**

A supply test item requires students to furnish their own answers. They are not given alternative responses from which to choose. The basic forms of supply questions are completion, short answer, and essay. Supply test items are mechanically easier to construct than selection items but far more difficult to evaluate.

**Advantages:**

1. When the ability to express ideas or original thinking is to be measured, supply items have a distinct advantage over selection items. The ability to solve problems and to think creatively is seldom worthwhile end products in themselves; it is usually necessary to communicate the solutions or ideas to others, frequently in writing.

2. When developing the ability to write clearly is a legitimate course objective, supply items may be used effectively. Test items that call for a written discussion, such as the essay form, also give students an opportunity to express themselves—something students often like to do.

**Disadvantages:**

1. Constructing a supply item for which several equally competent instructors can give comparable scores is difficult. This difficulty in attaining objectivity often leads to reduced test reliability. The supply item requires considerably more time to score than a selection item.

2. Another disadvantage of the supply item stems from the ability of students to think and read more rapidly than they write.

**Completion Items and Fill-in-the-Blank Items.** Completion items and fill-in-the-blank items require the student to provide one or more words omitted from a statement. The student must supply at least part of the idea expressed in the statement. When the correct word or words are supplied in the proper blank, the statement is complete and true. This virtually eliminates the possibility of guessing and it is a timesaving device in comparison with the essay test. The completion and fill-in-the-blank items can be used in testing student ability to make verbal associations of the who, what, when, where, and why types. When possible, use completion and essay items to measure such student behaviors as explain, define, and describe.
**Tips for Preparing Completion Items and Fill-in-the-Blank Items:**

1. Construct a completion item so it contains only one blank in each sentence.
2. Write the statement so that the blank appears at or near the end of the item.
3. Be sure there is only one correct or best response for each blank.
4. When testing comprehension and higher levels of learning, write word completion statements so they differ from the way they were worded in texts or lectures.
5. Make all blanks uniform in length and indicate whether a single blank always requires one word or whether short phrases may sometimes be supplied.
6. For convenience and accuracy in scoring, include a separate series of blanks arranged in a vertical column on the test page.

**Short-Answer Items.** In general, the short-answer item, as a type of supply test item includes features of both the completion and the essay item. It may be used in measuring the ability to recall facts, basic concepts, and principles.

**Tips for Preparing Short-Answer Items:**

1. Be specific. The student should know exactly what is expected.
2. Be sure each required answer involves a simple idea, concept, or fact.
3. Be sure students know how complete to make their responses.

**Essay Items.** The essay test items should be used only when students are required to think reflectively or creatively, to organize knowledge in the solution of a problem, and to express their solution in writing.

**Tips for Preparing Essay Items:**

1. Generally, use essay items to measure achievement at the comprehension or higher level of learning.
2. State the items clearly so students will know exactly what type of discussion is required and mean essentially the same thing to all students who have achieved the desired level of learning. Revise or eliminate all items with a double meaning.
3. Whenever possible, increase the number of test items and reduce the amount of discussion required for each.
4. Suggest a time limit for each item. Indicate the desired length of response, or otherwise limit responses.
5. As part of the instructions to students, explain how each item affects the final score of the overall test and the possibilities of partial credit for each item.
6. Avoid making the answer to a first item the basis for a second item.
The AFJROTC curriculum consists of textbooks and Instructor Guides with the lesson content and materials necessary to teach the courses. Over the past 10 years, the curriculum has transformed from a 20th century “teacher-centered” traditional learning environment and lecture mode to a “learner-centered” 21st century approach. The transformation started with the creation of state-of-the-art textbooks and alignment to national educational standards. Then in 2008, 21st century teaching and learning was infused into the lesson plans and other curriculum materials. The curriculum has evolved into engaging, student-centered courses capable of satisfying elective—and in certain situations—core credit requirements.

**The Structure of the Courses**

The basic structure of the courses depends on when each course was created. Courses created through 2008 were written in the original 20th century teacher-centered format, courses created in 2010 and beyond were transformed into the 21st century learner-centered format, and courses created 2012 and later incorporate the Revised Bloom’s and Worldwide Instructional Design System (WIDS®) format.

- **21st Century Format, Learner-Centered (Publication Dates: 2010 thru present):** AS 100, AS 200, AS 220, AS 300, LE 100, LE 200, and LE 300

<table>
<thead>
<tr>
<th>AFJROTC Curriculum</th>
<th>Pub Date</th>
<th>WB Files</th>
<th>LP Format</th>
<th>Test Bank Files</th>
<th>Website</th>
<th>E-Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 100: Milestones in Aviation History</td>
<td>2017</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AS 200: The Science of Flight: Gateway to New Horizons</td>
<td>2012</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>AS 220: Cultural Studies: An Intro to Global Awareness</td>
<td>2010</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS 300: Exploring Space: The High Frontier</td>
<td>2010</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LE 100: Traditions, Wellness, and Foundations of Citizenship</td>
<td>2015</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>LE 200: Communication, Awareness, and Leadership 2nd Ed</td>
<td>2017</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>LE 300: Life Skills and Career Opportunities</td>
<td>2013</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>LE 400: Principles of Management</td>
<td>2008</td>
<td>X</td>
<td>20th</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>LE 400: Fundamentals of Management</td>
<td>2019</td>
<td>+&lt;sup&gt;•&lt;/sup&gt;21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

X = Yes  | + = WIDS Lesson Plan Format
⊺ = CPS/NXT/TPC Database with Questions Embedded in the LPs
X = E-Book provided – Content and guidance provided in instructor guide.

*Instructions for companion websites can be found in the instructor guide.*
Textbooks
In 2003, the Academic Affairs Directorate began collaborating with commercial publishers to create the first commercially produced course, *Aerospace Science: The Exploration of Space*. The new textbook design incorporated richer content, vivid color pages and covers, and high impact graphics to motivate the students to read, study, and learn. It also added a CD with the electronic PDF files bound to the back of the textbook. This format became the basic design for future innovative, full-color textbooks.

The collaboration process continued, and in 2005 the first of the leadership education series—*Leadership Education I: Citizenship, Character, and Air Force Tradition*—was produced. Enhancements to the new LE textbook included using the new design, improving the readability, expanding on the “Checkpoints” review and questions, and adding a “Quick Write” feature—reading comprehension and writing activities utilizing critical thinking skills. The last textbook to be updated to this new format was in 2017—*AS 100: Milestones in Aviation History 2nd Edition*.

E-Book Supplemental Textbooks: (Beginning with LE 400 2019)
Engage your audience with mobile-friendly digital publications. Reach them on any device with an immersive, personalized content experience tailored to their unique interests. AFJROTC will customize content with complete creative freedom as C² Technologies provides and develop the Interactive Digital Publication (IDP) with the following features unless explicitly tailored:

- The IDP will provide the ability to listen to the book text or view a synchronized presentation of the text, images and audio narration using synthetic or human voices.
- Reflow ability to support multiple device sizes with a responsive design. The IDP will support resizing, changing the font, font size, line spacing and color contrast.
- Rich navigability. The IDP will support browsing the IDP by chapter, section, and page at minimum. Users will have the option of skipping footnotes, sidebars, producer notes and page numbers when reading continuously with assistive devices/readers.
- Audio and Video: Audio and Video will play in all devices.
- Tables: Tables will support resizing without loss in readability.
- Built in HTML5 for responsiveness
Instructor Guides and Lesson Plans
The Instructor Guides contain lesson plans and supplemental materials. Course objectives lay the foundation for the courses, and lesson objectives and samples of behavior identify desired outcomes. The format of the lesson plan is based on the Air Force model in the Guidebook for Air Force Instructors. Part I of the lesson plan includes the material covered and what teachers and students should do to prepare for the lesson and Part II contains the content of the lesson with embedded images of PowerPoint slides. The Part II is followed by the textbook review questions and answers. A typical Instructor Guide includes:

- Lesson plans with PowerPoint slides,
- National Standards and objectives,
- Activities, student handouts, and chapter projects,
- Test bank files and answer keys in Word,
- Classroom Performance System (CPS)/TPC files and databank: lesson questions, vocabulary questions, PPT slides, and test questions (2010 and later), and
- CD or DVD with these electronic files.
- URL and login information for companion websites.

NOTE: Detailed information for conducting each course is in the Preface of the applicable Instructor Guide.

Student Workbooks or Workbook Files (No Longer Supported or Provided)
Student workbooks were created for courses through 2008. The workbooks contained “test-type” items to include multiple choice, short answer, matching, true/false, fill-in-blank, and list or describe. The last workbook produced was for Leadership Education 400: Principles of Management, published in 2008. However, in an effort to provide “workbook-type activities,” Lesson Plans contain up to 5 individual/group activities. These activities also include at least one internet based research activity and support project based learning.

Only two curriculum textbooks have workbooks, AS100 and LE400, if workbooks are still in stock they may be ordered via WINGS Logistics until inventory is exhausted in the Holm Center warehouse. When a particular workbook is depleted, it is taken off the curriculum order form. Electronic versions of workbooks for active courses will remain available on the Instructor Guide CD and/or on WINGS | Menu | Published Files | Directory | JROTC | AFJROTC Curriculum.

Test Banks
Starting in 2007 test banks were provided for the courses, first with Aerospace Science: A Journey Into Aviation History (2007) and then Leadership Education 400: Principles of Management (2008). Test banks and answer keys were created for each lesson in Word and placed on the Instructor Guide CD.

The subsequent courses published 2010 and later were designed with enhanced test banks with student workbook type items. Each lesson contains test bank files with approximately 40 test items correlated to objectives/samples-of-behavior. These items include multiple choice, short answer, matching, fill-in-the-blank, true/false, list or describe, and an occasional case study. If desired, these can also be used as “student workbook” type items for homework or quizzes.
21st Century Teaching and Learning

In 2008, Academic Affair’s continuous improvement process continued with the transformation of the Instructor Guides and lesson plans and the implementation of the Classroom Performance System (CPS) student response system by eInstruction (now Interactive Learning). 21st Century teaching and learning was infused—it utilizes a “Learner-Centered” approach to engage students while preparing them to live and work in a global society. In addition, the “Framework for 21st Century Learning” model created by the Partnership for 21st Century Skills was adopted. It includes 21st century skills, methods, strategies, tools, standards, and assessments. This was the first major update to the lesson plans in more than four decades.

21st Century Skills were integrated throughout the courses. They are:

- Learning and innovation skills—critical thinking and problem solving, communication and collaboration, and creativity and innovation;
- Information, media, and technology skills—information literacy, media literacy, and ICT (information, communications, and technology) literacy; and
- Life and career skills—flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility.

The major changes to the lesson plan format included:

- Changed the lesson time from 50 minutes to 1 hour 30 min
- Integrated the national standards directly into lesson plans and created correlations
- Decreased amount of “lecture” time—changed to a “mini-lecture” of approximately 15 minutes to lay the lesson foundation
- Incorporated formative and summative assessments throughout
- CPS/TPC questions embedded in the lessons; also added vocabulary questions
- Included four learner-centered activities per lesson including technology enrichment
- Created one main project per chapter using “project-based learning” and “assessment”
- Include 21st teaching and learning and 21st century skills
Revised Bloom’s and the New Hybrid Lesson Plan Format

Additionally, in 2012 further enhancements were made to the curriculum. The Revised Bloom’s Taxonomy and Worldwide Instructional Design System (WIDS®) model were incorporated into the courses, beginning with the new Science of Flight course. The WIDS model utilizes Gardner’s Multiple Intelligences, and activities were integrated into the body of the lesson plan. (For more information on Gardner’s Multiple Intelligences, refer to the distance learning courses provided by HQ AFJROTC Instructor Management Division). The combination of the Revised Bloom’s Taxonomy, WIDS model, and AF format results in a hybrid lesson plan producing outcomes-based curriculum. These updates built on the 21st century teaching and learning design features introduced in the new cultural studies and exploring space courses.

The new design includes course outcomes, learning outcomes, and learning objectives.

“Course Outcomes” replace course objectives:
- Start with a single cognitive domain verb at a higher level of learning using “Revised Bloom’s Taxonomy” (Apply, Analyze, Evaluate, and Create)
- Describe what you want your learners to be able to “do” with what they “know”
- Are measurable and observable through performance assessments

“Learning Outcomes” indicate desired lesson outcome:
- This is “what” students should learn to do by the end of each lesson
- Identifies the major skill or knowledge targeted in each lesson
- Indicates a single outcome per lesson

“Learning Objectives” replace lesson objectives and samples of behavior:
- Serve as the benchmarks for learning
- Learning activities support learning objectives; provide opportunities to “learn the outcome”
- Multiple learning objectives for each lesson’ starts with related action verb

“Project-Based Learning and Assessments”:
- Knowledge is taken into account, but the primary evidence is performance
- Performance assessment task includes performance standards, performance condition, and criterion, and defines when proficient
National Standards and Standards-Based Curriculum

In 2003, the courses were correlated to national standards using the Mid-Continent Research for Educational and Learning (McREL) standards. This “Standards and Benchmark Review” correlation of the curriculum was performed by Troy University in Montgomery Alabama; the only course not included was Survival.

Beginning in 2006 as the courses were revised, the national standards were added into the course materials—in the textbooks for courses published through 2008, then in the Instructor Guide for publications 2010 and later. In addition to the McREL standards, the other national standards alignments include the:

- National Science Education Standards (NSES),
- Next Generation Science Standards, (NGSS)
- Math Standards and Expectations,
- National Council for the Social Studies (NCSS),
- Geography for Life – National Geography Standards,
- ISTE National Educational Technology Standards for Students (NETS●S),
- Common Core English-Language Arts National Standards,
- Common Core State Standards for Mathematics, and
- National Health Education Standards (NHES).

NOTE: Common Core Standards for Mathematics have been correlated for content in chapters 1 and 2 of LE 300. Common Core English-Language Arts National Standards have been included in LE 200 and AS 100 revisions.

The correlations and alignments provide the foundation for standards-based curriculum and should assist you in meeting your district and state requirements.

Formative and Summative Assessments

The lessons incorporate rigorous formative and summative assessments that focus on standards-based student-centered activities and projects. There are individual, group, and class activities and technology enrichment based on the objectives; readings; writing and reflection; review questions; video segments; and assessments to guide in the reinforcement of the materials. In many instances, the teacher acts as a facilitator. The technology enrichment activities also go beyond the basic fact-finding to enable the students to apply, analyze, and/or evaluate what they’ve discovered through their web-based research.

The activities and projects are designed to facilitate higher-order thinking skills and actively engage students while bringing the courses into the 21st century. Most of the activities and projects enable the students to attain at least the comprehension level, and many of them go beyond to the application and higher levels.

The formative assessments include the “Checkpoints” Review questions in the textbook at the end of each lesson; CPS/TPC lesson learning check, review, and vocabulary questions; and activities with individual and collaborative group work. Summative assessments consist of the test bank items with student workbook-type questions, and projects with rubrics.
Each unit or chapter culminates with a capstone project using project-based learning (PBL) and assessment. The PBLs involve a project or problem incorporating real-world problems. Students work in collaborative groups to solve problems or create projects using authentic tasks; the projects embrace 21st century skills. There are also detailed project rubrics for research and writing, group work, and project presentations.

Assessments are linked to the course objectives/outcomes and the lesson objectives. This alignment illustrates the correlation:

| Course Outcome: | Analyze how economic, political, and social factors impact cultures. |
| Learning (lesson) Outcome: | Describe the economic and social issues in Asia. |
| Learning Objective: | Describe the environmental impact of industrialization without regulatory standards in China. |
| Lesson Activity: | Conduct research and deliver a presentation on an assigned economic or social issue. |
| Test question: | What is the most significant environmental problem facing China today? |
| Chapter Project: | As a group, present a newscast on issues and/or topics facing Asia. Investigate the issues/topics and examine the impact of events. |

**Alignment of Course Outcomes Through Course Assessments**
Student Engagement Devices

Pulse / NXT / Turning Point Cloud (TPC)

The Pulse, NXT, and TPC by Turning Technologies are interactive, student response systems that infuses technology into the classroom. This allows instructors to actively engage and involve the students throughout the entire class. This engagement system provides a fun, interactive way for the students to learn the materials being taught in addition to allowing you to monitor students’ success at answering questions and understanding the lessons. It will equip you with major tools to create a technology-rich classroom supporting 21st century teaching and learning.

Starting the 2016 school year units will begin transitioning from a CPS/Pulse platform to the Turning Point Cloud (Pulse/TPC or NXT/TPC) platform as their primary deployment of response technology in the classroom. Turning Point Cloud software with Pulse/NXT hardware provides instructors with the following fundamental elements:

a. Allowing for open-ended and constructed response questions digitally captured
b. A platform that allows for future development to integrated new requirements

CPS was first obtained and implemented in 2008 for AFJROTC units worldwide. Through collaboration with Turning Technologies / Interactive Learning, the “Question Bank for Classroom Performance System (CPS) 1 Dec 08” database and CD was created and included courses published through 2008; the CPS files consist of lesson questions, vocabulary, and PPTs; and also test questions for the aviation history and principles of management courses (see information in “Test Banks”). The files also include Survival and Drill and Ceremonies; however, survival includes lesson questions and vocabulary only since no slides are available. Courses published in 2010 and later have the CPS/TPC embedded in the lesson plans (e.g., lesson questions) and have a separate CPS/TPC database with all the course files on their Instructor Guide CD or DVD.

School districts across the United States and DoDEA are now investing in mobile electronic devices such as iPads, tablets, laptops and applications for smart phones to stimulate student engagement within the classroom. HQ’s Curriculum agrees that in some cases these devices provide the same capabilities as CPS/NXT/TPC. Units desiring to replace the HQ’s provided Pulse/NXT/TPC system with a school provided system or device MUST submit a waiver request. The waiver request MUST contain the following:

1. How device provides the same capabilities for student response/engagement as Pulse/NXT/TPC. Open-ended and constructed response questions must be digitally captured for immediate feedback to cadet.
2. How device will be updated with HQ’s mandated curriculum materials. All devices and websites must provide password protection for copyrighted curriculum materials.
3. Instructors must state how curriculum, test banks, activities, and PPT’s will be transferred from Pulse/NXT/TPC to school provided system/device.
4. Supporting documentation must be signed by school principal.
5. Submit waiver requests through WINGS | Unit Management | Unit Waivers | Add New Value | Curriculum Policy | Submit.
Companion Websites

In 2012 the first-ever companion website for an AFJROTC course was created — *The Science of Flight: A Gateway to New Horizons*. The first leadership course to receive this exciting enhancement is the new *Leadership Education 300: Life Skills and Career Opportunities*. These innovative, engaging educational tools offer online resources to support classroom education. The websites are designed to provide students with study aids to help them master the material in the textbook, prepare for upcoming classes, expand the scope of the textbook, and grant them access to student resources and up-to-date information. Additional web links and resources are available for teachers only. Student resources include items such as crossword puzzles, interactive glossaries, interactive flashcards, checkpoints lesson reviews, quizzes, and web links.

Since not all students have access to the internet for online learning or homework assignments, here are some ideas on how you can incorporate this technology into your classrooms.

- If you have a computer with Internet capability in your classroom, access the companion website and display the resource/activity from the computer onto your large screen or board
- Allow the students to complete the activity individually or as a group
- Conduct the activity as a team event
- Print out a hard copy and use as a review or class quiz

**Final things to note:**

- Read the Instructor Guide Preface for important information about the courses
- Review the new AS 100, 200, 220, 300 and LE 100, 200, and 300 courses to provide ideas on how to incorporate 21st century activities and projects into the “original” formatted courses
- Review the DL courses provided by HQ AFJROTC Instructor Management Division for information on Gardner’s Multiple Intelligences
- Access WINGS to review the Curriculum folders: WINGS | Menu | Published Files | Directory | JROTC | AFJROTC Curriculum
In the Classroom

The following section addresses areas of interest to new instructors in AFJROTC. It briefly discusses selected aspects of teaching.

Here are some suggestions to be the best instructor possible and have students learn what is expected of them through the AFJROTC curriculum in the most effective way, as well as make the job of teaching easier and more enjoyable:

1. **Knowledge of Content.** Know what to teach (the subject), in what amounts, in what sequences, at what rates, with what expectancies and standards of achievement.

2. **Use of Materials.** Use all appropriate facilities and services provided by the Air Force, the school, and the community.

3. **Human Relations.** Relate to the students with respect to their background, goals, readiness, aptitude, intelligence, and adjustment problems.

4. **Classroom Management.** Understand the learning process and the adolescent you are teaching.

5. **Planning.** Select and prepare instructional materials and equipment. Plan and direct cadet activities to ensure appropriate motivation, control, and educational experiences.

6. **Assessment.** Assess and evaluate student achievement.
Teaching Methods

Good teaching methods aid learning. The instructor should choose a teaching method (also called instructional method and/or strategy)—not in terms of instructor activities—but in terms of the students’ activities as a learner. In making this decision, the instructor considers the ways people learn—by doing, discussing, listening, observing, and participating. The instructor’s role is to select an organized set of activities that will result in meaningful, learning experiences for the students.

Because no one particular method is suitable for all teaching situations, examples of many methods are covered here. To determine an appropriate method, if the desired outcome is knowledge, students should probably observe and listen so they can relate what is seen and heard to their own experiences. If students must learn to apply a principle, the instructor might ask them to solve a problem or perform some task requiring an application of that principle. If students are to gain skill in performing a certain task, one of their activities should be to practice performing the task. The individual methods are grouped into three broad major categories—presentational methods, student verbal interaction methods, and application methods.

<table>
<thead>
<tr>
<th>Presentation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal lecture, briefing, guest lecturer, dialogue, teaching interview, panel,</td>
</tr>
<tr>
<td>skits, coaching, tutoring, reading, programmed instruction, modular instruction,</td>
</tr>
<tr>
<td>computer-assisted instruction, mediated instruction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Verbal Interaction Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socratic method, student query, guided discussion, free discussion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Projects, field trips, case studies, and experiential learning</td>
</tr>
<tr>
<td>• Experiential learning activities include real-life simulations, role playing,</td>
</tr>
<tr>
<td>in-basket exercises, organizational or management games, and flight simulators.</td>
</tr>
</tbody>
</table>

**Presentational methods** provide situations in which the skill or material to be learned is in some way presented to or demonstrated for the learner. In some presentational methods there is little, if any, activity or interaction required of students other than their attention and desire to learn. In other instances, there is considerable student activity involved. What distinguishes these methods from the other categories is that students begin the learning experience with little or no previous exposure to the material or skills to be learned.

**Student verbal interaction methods** present situations in which students interact verbally with an instructor, group leader, or with each other. Learning is enhanced as students deal with the material as a group. These methods presuppose a certain amount of previous preparation by the students.
Application methods provide learners with opportunities to apply previously learned material in situations calling for the practical use of the material. Some application methods require students to relate material already learned to new experiences and mentally recognize how the material applies; that is, to transfer concepts to new situations. Other application methods require students to apply previously learned materials to new situations for the purpose of making decisions or solving problems.

The following provides a brief description of the most commonly used methods in the AFJROTC courses:

1. **Lecture Method.** The teaching lecture is a formal or informal presentation of information, concepts, or principles by a single individual. The formal lecture is usually given to large groups of people (more than 100) with no active participation by the students. The learning experience is essentially passive. In the informal lecture, the size of the group is usually smaller than the formal lecture and student participation develops when the instructor questions the students or they question the instructor on points presented.

2. **Questioning Method.** Questioning as a method is used to emphasize a point, stimulate thinking, keep students alert, check understanding, review material, and seek clarification.

3. **Non-Directed Discussion Method.** Non-directed discussion is a group interactive process in which task or objective-related information and experiences are evoked from the student. The instructor normally plays a very limited or passive role.

4. **Guided Discussion Method.** The guided discussion is an instructor-controlled, interactive process of sharing information and experiences related to achieving an educational objective. The difference between non-directed discussion and guided discussion is the instructor's active involvement in asking questions and summarizing the concepts and principles learned.

The instructor interacts with the group as a whole through questions, but tries not to dominate the discussion through the use of lead-off questions, follow-up questions, and anticipated responses. Students are encouraged to learn about a subject by actively sharing ideas, knowledge, and opinions. The flow of communication is a transaction among all the students rather than question and response between individual students and the instructor. The method employs the general-to-specific presentation to help students form generalizations.

5. **Teaching Interview.** The instructor questions a visiting expert and follows a highly structured plan that leads to educational objectives. The advantage of the teaching interview over the guest lecture is that the instructor controls the expert's presentation. The expert normally requires little or no advance preparation, but responds extemporaneously from general experience. When a question-and-answer period follows the interview, students can interact with the expert.

**Case Studies.** The case study is a learning experience in which students encounter a real-life situation in order to achieve some educational objective. By studying realistic cases in the classroom, students develop new insights into the solution of specific on-the-job problems and also acquire knowledge of the latest concepts and principles used in problem solving.
Case studies designed to reach the levels of apply, analyze, evaluate, and/or create are within the scope of the term Application Method. However, case studies designed to reach only the level of understand may be defined better as a Student Verbal Interactive Method. The complexity of the case, the level of the objective, and how the case is conducted will have a major impact on whether it is one or the other.

6. **Demonstration-Performance Method.** The demonstration-performance is the presentation or portrayal of a sequence of events to show a procedure, technique, or operation, frequently combining oral explanation with the operation or handling of systems, equipment, or material. This method is the most commonly used small group learning experience in a classroom or laboratory (which requires significant instructor intervention) to develop learner skills in the operation of equipment or the acquisition of mental skills.

7. **Experiential Learning.** The experiential method of learning centers on the students participating in structured learning activities that focus on a specific learning objective. Ideally, the activity has a direct real-world relevancy.
Teaching Methods Used in Courses

Here are the various methods, tools, and activities used in the courses. They include the original methods identified in the *Guidebook for Air Force Instructors*, and the 21st century learner-centered approaches. In the learner-centered (experiential) methods, the teacher is a facilitator/guide.

<table>
<thead>
<tr>
<th>Original Teacher-Centered</th>
<th>Original Learner-Centered</th>
</tr>
</thead>
<tbody>
<tr>
<td>(The teacher directs the learning process)</td>
<td>(Focuses on student interaction and activity)</td>
</tr>
<tr>
<td>• Informal lecture</td>
<td>• Small Group Discussion</td>
</tr>
<tr>
<td>• Class Discussion</td>
<td>• Case Study</td>
</tr>
<tr>
<td>• Guided Discussion</td>
<td>• Role Playing</td>
</tr>
<tr>
<td>• Teaching Interview</td>
<td>• Brainstorming</td>
</tr>
<tr>
<td>• Demonstration</td>
<td>• Performance</td>
</tr>
<tr>
<td>• Reading</td>
<td>• Field Trip</td>
</tr>
<tr>
<td></td>
<td>• Simulations</td>
</tr>
</tbody>
</table>

**21st Century Learner-Centered**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>• Discovery Learning: inquiry-based learning method</td>
<td></td>
</tr>
<tr>
<td>• Inquiry Learning: Problem-Based Learning, WebQuests</td>
<td></td>
</tr>
<tr>
<td>• Cooperative Learning: students work in small groups to solve a problem or complete a task</td>
<td></td>
</tr>
<tr>
<td>• Project-Based Learning or Problem-Based Learning (PBL): incorporates real-world situations or problems using authentic tasks; students work in collaborative groups to create projects utilizing 21st century skills such as critical thinking, communication, collaboration, and problem solving</td>
<td></td>
</tr>
<tr>
<td>• Digital Storytelling</td>
<td></td>
</tr>
<tr>
<td>• Graphic Organizer: strategy/tool</td>
<td></td>
</tr>
<tr>
<td>• Virtual Field Trip</td>
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</tbody>
</table>

**Methods Identified in Lesson Plans**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Informal Lecture with Discussion</td>
<td>• Internet Research</td>
</tr>
<tr>
<td>• Individual Writing and Reflection</td>
<td>• Reading</td>
</tr>
<tr>
<td>• Individual and Group Activities</td>
<td>• Chapter Project</td>
</tr>
<tr>
<td>• Class/Small Group Discussion</td>
<td></td>
</tr>
</tbody>
</table>

**Tools and Activities**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Journal/Blog: method of communication</td>
<td>• Podcasting: activity</td>
</tr>
<tr>
<td>• K-W-L Chart: tool</td>
<td>• Rubrics: tools</td>
</tr>
<tr>
<td>• Crossword Puzzle: tool/activity</td>
<td>• CPS/TPC</td>
</tr>
<tr>
<td>• Outline Map: activity</td>
<td>• Technology Enrichment</td>
</tr>
<tr>
<td>• Worksheet/chart and surveys</td>
<td>• Academic Challenge (CPS team activities/games)</td>
</tr>
</tbody>
</table>
Curriculum Models

Each academic course must consist of Aerospace Science (AS), Leadership Education (LE), and Wellness components, except where waived. Defined Courses are designed for the cadet to receive one academic year of instruction to meet Title 10 requirements. A model Defined Course should target 180 contact hours of instruction, if not possible, courses must consist of a minimum of 120 contact hours (contact time) for the academic year. As described in the Curriculum Guidance section, courses awarding “elective” credit MUST use a 40%-40%-20% Curriculum Model for each semester/term of instruction. Units that award “core” credit use a 60%-40% model for each semester/term. In both models, the Drill and Ceremonies portion of Leadership Education must not exceed 50% of the LE component. You will develop these courses in WINGS | Menu | Unit Management | Define Unit Courses | Add New Value.

Instructional Contact Hours

The minimum contact hours provided in the MOA is intended to ensure contact hours meets Title X requirements for school schedules. Instructors are expected to teach Holm Center Approved curriculum for the entire school year / term. Outside curriculum exceeding 10% or additional outside classes must be approved by Holm Center Academic Affairs/DEJ (Curriculum Policy waiver) prior to adding any curriculum exceeding 10% or additional classes.

The Standard Curriculum Model (40%-40%-20%)

Units that teach the course for elective credit use this model. The contact time focuses on 40% AS material, 40% LE (includes 20% of LE 100, 200, 300, or 400 and 20% Drill Curriculum (Cumulative), and 20% on Wellness/PT. Maximum contact hours (contact time) for elective credit classes are:

<table>
<thead>
<tr>
<th>Aerospace Science</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 100: Milestones in Aviation History 2nd Ed.</td>
<td>72</td>
</tr>
<tr>
<td>AS 220: Cultural Studies: An Introduction to Global Awareness</td>
<td>72</td>
</tr>
<tr>
<td>AS 300: Exploring Space: The High Frontier</td>
<td>72</td>
</tr>
<tr>
<td>AS 400: Management of the Cadet Corps AS</td>
<td>72</td>
</tr>
<tr>
<td>410: Survival</td>
<td>72</td>
</tr>
<tr>
<td>AS 500: Aviation Honors Ground School AS</td>
<td>72</td>
</tr>
<tr>
<td>510: Honors Senior Project</td>
<td>36</td>
</tr>
<tr>
<td>AS STEM Courses</td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leadership Education</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE 100: Traditions, Wellness, and Foundations of Citizenship</td>
<td>40</td>
</tr>
<tr>
<td>LE 200: Communication, Awareness, and Leadership, 2nd Ed.</td>
<td>40</td>
</tr>
<tr>
<td>LE 300: Life Skills and Career Opportunities</td>
<td>40</td>
</tr>
<tr>
<td>LE 400: Principles of Management</td>
<td>36</td>
</tr>
<tr>
<td>Drill Curriculum: Cumulative</td>
<td>36</td>
</tr>
<tr>
<td>LE ELECTIVES</td>
<td>18</td>
</tr>
</tbody>
</table>

Wellness (PT) 36
The “Core” Credit Curriculum Model (60%-40%)

In schools where core credit is awarded, 60% of available contact time per semester/term may be spent teaching AS material and 40% on LE (or 60% on LE and 40% on AS, depending upon which component justifies the awarded core credit) for each semester/term the course is taught. **Core credit is to be based solely on the content of the AFJROTC curriculum and not based on the use of outside supplemental curriculum.**

Instructors including state/district mandated material in order to receive core credit must include the amount of this material when defining the unit course in WINGS. Maximum contact hours (contact time) for **CORE CREDIT** classes are:

<table>
<thead>
<tr>
<th>Aerospace Science</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 100: Milestones in Aviation History 2nd Ed.</td>
<td>108</td>
</tr>
<tr>
<td>AS 220: Cultural Studies: An Introduction to Global Awareness</td>
<td>108</td>
</tr>
<tr>
<td>AS 300: Exploring Space: The High Frontier</td>
<td>108</td>
</tr>
<tr>
<td>AS 400: Management of the Cadet Corps</td>
<td>108</td>
</tr>
<tr>
<td>AS 410: Survival: Survive • Return</td>
<td>108</td>
</tr>
<tr>
<td>AS 500: Aviation Honors Ground School</td>
<td>108</td>
</tr>
<tr>
<td>AS 510: Honors Senior Project</td>
<td>36</td>
</tr>
<tr>
<td>AS STEM Courses</td>
<td>18</td>
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</table>

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<td>LE 100: Traditions, Wellness, and Foundations of Citizenship</td>
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</tr>
<tr>
<td>LE 400: Principles of Management</td>
<td>36</td>
</tr>
<tr>
<td>LE 400: Fundamentals of Management</td>
<td>40</td>
</tr>
<tr>
<td>Drill Curriculum: Cumulative</td>
<td>36</td>
</tr>
<tr>
<td>LE ELECTIVES</td>
<td>18</td>
</tr>
</tbody>
</table>

**No Child Left Behind Act (NCLBA) Defined Core Classes**

Core Credit defined classes was established by the No Child Left Behind Act (NCLBA) of 2002. The following content areas are recognized as receiving Core Subject Credit under NCLBA:

- English/Language Arts
- Math
- Science
- Foreign Languages
- Civics and Government, Social Science, History, Geography
- Economics
- Fine Arts (Music, Visual Art, Drama/Theater Arts, JROTC in some states)
- Dual-Enrollment Courses
- Honors Courses (AHGS / Honors Project)

Using this definition will standardize how the waiver board will consider requests from units stating that they receive core credit. Subject areas listed below are examples of courses that are considered Graduation Credit content areas and **DO NOT** receive NCLBA Core Subject Credit:

- Health Ed
- PE
- CTE, Trades and Industry, Practical Arts, Life Skills
- Speech
Seven-Year Curriculum Plan

Each unit must develop and maintain a complete seven-year curriculum plan. This plan must display the courses used for the current academic year and those courses taught the previous three academic years, and courses projected for the future three academic years. The seven-year curriculum plan must visually depict how the unit ensures a cadet will not repeat the same course content (specific units and/or chapters) over their entire period of enrollment in AFJROTC. **Cadets WILL NOT take the same chapter/unit twice without curriculum waiver approval.** Units must carefully consider the content used during the past three academic years to avoid any cadets repeating curriculum.

The curriculum plan will be reviewed by Regional Directors during their visits to ensure instruction is proceeding as planned and that the unit is not deviating from the intent of the AFJROTC curriculum program. The basic layout of “Sample” templates for Blended Classes, Traditional, A/B, 4X4, Block, and Trimester schedules for curriculum planning have been posted in WINGS | Published Files | Directory | JROTC | AFJROTC Curriculum | Curriculum Guide.

Each “Sample” curriculum plan templates will show an outline of how courses or parts thereof are to be taught, by cadet year: Traditional, Block, or Trimester. Scanning down a column will show how many and which AS and LE courses are being taught during a particular term or year. Scanning diagonally downward and to the right will show a particular student’s progress through four different sets of AFJROTC courses.

Use the sample templates provided to create your own plans. Replicate the applicable template and fill in the planned courses in the appropriate columns for each cadet year group. Next, describe the STEM, electives, blending plans, and cadets to be taught. **This curriculum planning format is not the only way to show curriculum sequence**, but is provided to illustrate an example of an acceptable plan. As long as the plan devised by a unit meets the requirements stipulated or unit obtains a waiver from DEJ, the exact curriculum planning format used is not important.

**The following applies to all templates:**

1. Holm Center/DEJ-provided materials must be used for all courses listed.
2. DEJ-provided curriculum is the predominate courseware used to teach each class. (Otherwise a waiver must be on file)
3. **Core credit is to be based solely on the content of the AFJROTC curriculum and not based on the use of outside supplemental curriculum.**
4. For core credit classes, AS/LE mix may be 60%-40%, to meet core credit requirements.
5. Authorized supplemental material includes any DEJ-provided supporting materials or related outside videos, news articles, activities, games, etc. (if more than 10% is used, a waiver is required)
6. LE and AS material is blended within each course, with a wellness component being taught 20% of the time each week, to provide a 40%-40%-20% mix (2 days AS, 2 days LE/Drill, and 1 day Wellness per week).
7. First year cadets should be grouped together for LE-100/AS-100 classes and should be taught introductory material.
8. Upper class cadets maybe grouped together for other AS and LE courses.
9. Selected upper class cadets are enrolled in AS-400: Management of the Cadet Corps, instead of classes listed.
10. Selected 11th and 12th grade honor students may be enrolled in AS-500, Aviation Honors Ground School, instead of in AS courses listed.
11. Class sizes are determined by SASI or ASI.
12. Units in blended classes should teach all grade levels on rotational AS/LE schedule instead of trying to teaching each level a different AS/LE course, unless grade levels can be separated into different classrooms.
13. Sample curriculum plans incorporate DEJ-provided electives into the LE components to illustrate how this may be done.

Creating Unit Defined Courses in WINGS
As stated earlier, the curriculum is provided by the Holm Center Academic Affairs Directorate may be augmented by school requirements and/or instructor preferences (e.g., customization of curriculum and/or unit-defined curriculum). In WINGS, the “Define Unit Courses” module is designed to help you create, organize, and track the curriculum that is being presented to your cadets. The Holm Center WINGS User’s Guide will walk you through the steps of viewing provided curriculum, creating custom curriculum, organizing curriculum to define courses, and creating a class by rostering cadets to your defined courses.

**NOTE:** Customized (Unit Defined) curriculum will require a curriculum policy waiver approval if it exceeds 10%.

Specifically, this tool allows AFJROTC instructors an electronic mechanism to create curriculum plans with enhanced capabilities. This tool will assist you in defining your courses from a seven-year curriculum plan, customize unit defined curriculum, create classes by rostering students to courses (enabling your ability to run reports with student course completion), and easily track contact hours. Unit Defined Courses are designed for the cadet to receive one year of instruction to meet Title 10 requirements. Additionally, when defining Traditional, Trimester, and A/B courses, courses must be defined by semester. For 4X4 and Block schedules, each course will be defined as a term. These capabilities are important for the future of AFJROTC in regards student completion certification, graduation, and AdvancED SACS CASI accreditation.

To access this section in WINGS go to: WINGS | Menu | Unit Management | Define Unit Courses.
Typical TRAD/AB/TRI Schedule Defined Unit Course with LE Elective Added

Typical TRAD/AB/TRI Schedule Defined Unit Course with STEM Added

Important Things to Remember:
- When defining a course, you are required to maintain a 40 AS / 40 LE / 20 Wellness curriculum model unless a waiver has been approved by Holm Center/DEJ.
- Curriculum model percentages do not have to be exact; you are allowed +/- 4% high or low.
- Drill **WILL NOT EXCEED** more than 50% of the LE component. (Unless a waiver has been approved)
- STEM and LE Electives may supplemental Holm Center curriculum, but will not replace it.
<table>
<thead>
<tr>
<th>CADET YEAR</th>
<th>Fall 2018</th>
<th>Spring 2019</th>
<th>Fall 2019</th>
<th>Spring 2020</th>
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**NOTES:**
- Introductory AS/LE course material should be taught during first semester or block.
- * Repeat LE100, Chapter 1 for Blended Classes containing first year cadets is authorized.
- **LE ELECTIVES (E1-E7):** Guidance for using LE Electives can be found on pages 10 & 199.
- **AS STEM:** Guidance for using (STEM) opportunities can be found on pages 9 & 119.
- **AS 400:** is intended for 4th year cadets who hold corps management positions, refer to page 99 for additional guidance.
- **AS 500: Aviation Honors Ground School (AHGS) Guidance** for this course is found on pages 11 and 113.
- Additional Sample 7-Year Curriculum Plans have been posted on WINGS / Published Files / Directory / JROTC / AFJROTC Curriculum / Curriculum Guide.
Sample Curriculum Plan Template for “Traditional, A/B Schedule”

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### NOTES:

- Introductory AS/LE course material should be taught during first semester or block.
- Scanning down diagonally to the right will show a particular cadet’s progress through four different sets of AFJROTC courses.
- * Repeat LE100, Chapter 1 for Blended Classes containing first year cadets is authorized.
- **LE ELECTIVES:** Guidance for using LE Electives can be found on pages 10 & 199.
- **AS STEM:** Guidance for using STEM opportunities can be found on pages 9 & 119.
- AS 400: is intended for 4th year cadets who hold corps management positions, refer to page 99 for additional guidance.
- **AS 500:** Aviation Honors Ground School (AHGS) Guidance for this course is found on pages 11 and 113.
- **AS 510: Honors Senior Project:** guidance found on pages 12 and 118 of the curriculum guide.
- Additional Sample 7-Year Curriculum Plans have been posted on WINGS / Published Files / Directory / JROTC / AFJROTC Curriculum / Curriculum Guide.
### Sample Curriculum Plan Template for “4x4 | Block” Schedule

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**NOTES:**

- Introductory AS/LE course material should be taught during first semester or block.
- Scanning down diagonally to the right will show a particular cadet’s progress through four different sets of AFJROTC courses.
- * Repeat LE100, Chapter 1 for Blended Classes containing first year cadets is authorized.
- **LE ELECTIVES:** Guidance for using LE Electives can be found on pages 10 & 199.
- **AS STEM:** Guidance for using STEM opportunities can be found on pages 9 & 119.
- **AS 400:** is intended for 4th year cadets who hold corps management positions, refer to page 99 for additional guidance.
- **AS 500:** Aviation Honors Ground School (AHGS) Guidance for this course is found on pages 11 and 113.
- **AS 510:** Honors Senior Project; guidance found on pages 12 and 118 of the curriculum guide.
- Additional Sample 7-Year Curriculum Plans have been posted on WINGS / Published Files / Directory / JROTC / AFJROTC Curriculum / Curriculum Guide.
### Sample Curriculum Plan Template for a “Trimester” Schedule

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#### NOTES:
- Due to page space, indicates 3 years prior, present, and 2 years out.
- Introductory AS/LE course material should be taught during first semester or block.
- Scanning down diagonally to the right will show a particular cadet’s progress through four different sets of AFJROTC courses.
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**Cadet Guide / Unit Operating Instruction**

Unit’s will publish a Cadet Guide or unit operating instruction to which all cadets have access. Cadet Guides will contain the following minimum items:

- Current uniform wear, personal appearance and grooming requirements as defined in AFI in AFI 36-2903, AFJROTCI 36-2010, and supplemental HQ guidance.
- Information on applicable program opportunities such as post-graduation benefits and co-curricular activities such as Kitty Hawk Air Society, Drill Team, Color Guard, CIA trips, marksmanship, rocketry, quadcopters, annual community service projects, etc.
- Cadet expectations, such as conduct standards, classroom procedures, saluting, etc.
- Prohibition of physical discipline and hazing as outlined in AFJROTCI 36-2001.
- Information on cadet promotion opportunities, including unit-specific promotion and demotion procedures.
- Information on Cadet Corps operational and functional areas such as Logistics, Personnel, Support, Public Affairs, etc.
- If a unit offers team awards, national awards or HQ-approved specialized ribbons, the specific criteria for earning these will be published in each unit’s Cadet Guide. These awards/ribbons are listed in the AFJROTC Operational Supplement.
- Many awards/ribbons already have minimum criteria defined in the AFJROTC Operational Supplement. Units may add additional criteria, but this must be clearly published in their Cadet Guide or operating instruction.
- Reserve Cadet participation requirements such as uniform wear, community service events, etc., must be included in the unit’s Cadet Guide.

**Course Syllabus**

A well-prepared syllabus is not only valuable for students, but also for the instructor. A course syllabus lets students know on the first day of class what is expected of them so they can plan their semester and school year. It serves as an informal contract between the instructor and the student.

A course syllabus must be available to each cadet for every AFJROTC course taught during the school term. The syllabus will be accessible to students on the first day of the school.

The course syllabus should be in the format directed by the school. When the school does not specify a particular format, instructors are encouraged to use the “sample” syllabus template provided on the following page.

A syllabus should contain as a minimum: course name, instructors name(s); basic purpose or description of the class (be concise); course objectives or outcomes; grading procedures; physical training requirement; uniform day; textbook chapters/units, electives, STEM, and/or supplemental material and resources used; other rules, regulations, or requirements specific to the course or instructor. If supplemental/support material is used to enrich Holm Center provided curriculum is less than 10% of the programmed instructional time, a waiver is not required and it does not have to be part of the “defined course,” but does need to be reflected in the course syllabus.

Keeping the format simple is the recommended approach. The ‘sample’ template is provided as a starting point in developing unit course syllabi.
Sample Course Syllabus Template

COURSE NAME: (List the name of course)
CREDIT TYPE: (PE / Science / Civics / History / CTE, etc.)
INSTRUCTOR’S NAME: (List instructor names)

The Mission of Air Force JROTC is to develop citizens of character dedicated to serving their nation and community.

REQUIRED TEXT AND MATERIALS:
- Aerospace Science: Milestones in Aviation History
- Leadership Education I: Traditions, Wellness, and Foundations of Citizenship
- AF Manual 36-2203, Personnel Drill and Ceremonies, V-2627
- Drill and Ceremonies Student Workbooks (If available)
- Selected Video Tapes
- Cadet Guide

COURSE DESCRIPTION: (Give a description of the course. This information can be found in the Instructor Guide and in this Curriculum Guide. MUST include textbook chapters/units that are to be taught.)

AFJROTC I is the introductory course for all new cadets. The course consists of three components: Aerospace Science (40%), Leadership Education (40%), and Wellness/Physical Fitness (20%).

Aerospace Science 100 portion is an aviation history course focusing on the development of flight throughout the centuries. **During the Fall semester/block, we cover Chaps 1, 2, and 3. During the Spring semester/block, we cover Chaps 4, 5, and 6.** The emphasis is on civilian and military contributions to aviation; the development, modernization, and transformation of the Air Force; and a brief introduction into cyber. It is interspersed with concise overviews of the significance of the Wright Brothers, early American aviators, both male and female, and the role of commercial aviation.

Leadership Education 100 introduces the student to the Air Force Junior Reserve Officer Training Corps (AFJROTC) program, while instilling elements of good citizenship, develops informed citizens; strengthens and develops character; develops study habits and time management; wear of the Air Force uniform; and Air Force customs, courtesies and drill are introduced. **During the Fall semester/block, we cover Chapters 1-2. During the Fall semester/block, we cover Chapters 3-5.** Additionally, cadets will be taught the fundamentals of Drill and Ceremonies. This portion of the course concentrates on the elements of military drill, and describes individual and group precision movements, procedures for saluting, drill, ceremonies, reviews, parades, and development of the command voice. Students are provided detailed instruction on ceremonial performances and protocol for civilian and military events and have the opportunity to personally learn drill. Most of the work is to be hands-on.

Wellness/Physical Fitness portion incorporates the Cadet Health and Wellness Program (CHWP). The CHWP is an exercise program focused upon individual base line improvements with the goal of achieving a Presidential Physical Fitness standard calculated with age and gender. The goal of the CHWP is to motivate JROTC cadets to lead active, healthy lifestyles beyond program requirements and into their adult lives. Cadets will be given the opportunity to put into practice the wellness concepts that are taught in Leadership Education I.
COURSE OBJECTIVES AND OUTCOMES: (This information can also be found in the Instructor Guide and this Curriculum Guide.)

AS/Milestones in Aviation History:
First Semester/Chaps 1-3:
1. Describe historical facts and impacts of the early attempts of heavier-than-air flight.
2. Analyze the impact World War I aviation had on commercial aviation.
3. Examine the role aerial bombing had on the outcome of World War II.

Second Semester/Chaps 4-6:
4. Investigate the impact commercial jet aviation has had on US travel.
5. Analyze the lessons learned from global use of US airpower.
6. Evaluate developing technology that will affect the US Air Force of the future.

LE/Leadership Education: Drill and Ceremonies: Applies to both semesters.
First Semester LE /Chapters 1-2
1. Analyze the heritage, organization, and tradition of service programs.
2. Analyze the benefits of positive personal behavior.

Drill
1. Know the importance of drill and ceremonies.
3. Know basic commands and characteristics of command voice.
4. Apply and execute the concepts and principles of basic drill positions and movements.
5. Know when and how to salute.

Second Semester LE /Chapters 3-5
1. Evaluate healthy living through physical activity and good nutrition.
2. Apply safe, drug-free decisions.
3. Analyze the importance of citizenship in the United States.

Drill
1. Know the importance of drill and ceremonies.
2. Know basic commands and characteristics of command voice.
3. Apply and execute the concepts and principles of basic drill positions and movements.
4. Know when and how to salute.

Wellness and Physical Fitness: Applies to both semesters

Uniform Day:
Students **WILL** wear the Air Force JROTC uniform weekly (Wednesday) and the **issued** PT uniform on Friday.
1. Motivate AFJROTC cadets to lead active, healthy lifestyles beyond program requirements and into their adult lives.
2. Create an individualized training program based on national standards by age and gender.
3. Identify areas of improvements for each cadet.
4. Incorporate a physical training program to reach goals
Office Hours: Our standard duty hours are 0730 – 1515 hours. We are located in the room XXX. We have an open door policy, and you can come by and discuss anything you need to if we are available.

GRADING POLICY: (NOTE: These are only examples)

a. ACADEMICS 40%

b. LEADERSHIP 40%

c. CO-CURRICULAR ACTIVITIES 20%

Grading Scale: (NOTE: This is only an “example”, follow your school’s grading policy)

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<td>A</td>
<td>90% and above</td>
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<td>B</td>
<td>89% - 80%</td>
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<td>C</td>
<td>79% - 70%</td>
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<td>69% - 60%</td>
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<td>F</td>
<td>59% and below</td>
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Presentation:
You may be assigned an oral briefing. This assignment will be to demonstrate your verbal communication skills. You will prepare and present a 3 – 5 minute extemporaneous briefing on a subject to be determined. The target time for this presentation is 5 minutes and points will be deducted for those that are outside the 3 – 5 minute range. All topics will be submitted to the instructor for approval at a date to be specified later.

Written Assignments:
You may be required to complete a Talking Paper covering your presentation topic to be turned in one class before your scheduled presentation. The intent of this paper is to assist you in planning, organizing, and delivery of your presentation. Additional writing assignments may be assigned if it is determined additional research or effort is needed on a particular subject matter.

Attendance:
Attendance will be considered in determining your final grade but it is subordinate to measurable performance based on lesson objectives. You will lose points on attendance for being late (5 points from daily grade) or unexcused absences (“0” will be entered as a daily grade.) Ex-cused absences will not count against your daily grade, but missed work has to be completed. As an Air force Junior ROTC cadet, you will be expected to be punctual and present at your appointments.

A Detailed Sample Course Syllabus is provided in WINGS | Published Files | Directory | JROTC | AFJROTC Curriculum | Curriculum Guide | Sample_Course_Syllabus.docx
Instructors choosing to include supplemental material to reinforce HQ’s provided curriculum should include this material when defining the unit course in WINGS. Support material included during daily classroom instruction that exceeds 10% of the Defined Course will be defined by going to WINGS | Menu | Unit Management | Curriculum | JROTC Unit Defined Curriculum. If less than 10% of the programmed instructional time, a waiver is not required and it does not have to be part of the “defined course,” but does need to be reflected in the course syllabus. Supplemental/support material WILL NOT exceed 10% of instruction time without waiver approval from Holm Center/DEJ.

**NOTE: Due to budget constraints, once video stocks are depleted, they will no longer be replaced.**

1. **Legends of Airpower: The Complete Series** include summaries of the stories of twenty-six people who made America’s air power the most respected in the world. Each legend is profiled in a separate, thirty-minute biographical program that traces their personal and professional lives. Legends of Airpower are targeted at both air-power aficionados and general audiences who flock to historical documentaries. These series mythologize the personalities and personalizes the people behind the myths. *(A Journey Into Aviation History, The Science of Flight: A Gateway to New Horizons; Exploring Space: The High Frontier)*

*Season 1:* Chuck Yeager, Benjamin Davis and the Tuskegee Airmen, Billy Mitchell, “Duke” Cunningham, Jimmy Doolittle, Gabby Gabreski, Jimmy Stewart, Curtis LeMay, Bernard Schriever, Hap Arnold, Chuck Horner, Russ Dougherty, and John Glenn


*Season 3:* James Lovell, Everett Alvarez, Paul Tibbets, Igor Sikorsky, Donald Lopez, Deke Slayton, Robin Olds, Daniel “Chappie” James, Edward “Butch” O’Hare, Sam Johnson, Joe Foss, Tommy McGuire, Claire Chennault


2. **Aerodynamic Principles** is a unique video explaining the fundamental concepts of flight. It begins with an analysis of the four forces of flight, lift, weight, thrust, and drag -- and continues with easy-to-follow segments in maneuvering flight and airplane balance and stability. The program provides an excellent introduction to aerodynamics or a good basic review. A VHS format video entitled Basic Aerodynamics, is the same video as Aerodynamic Principles. The latter is the DVD version. There is no need to replace the VHS version with the DVD format, until the VHS version becomes unusable. *(The Science of Flight: A Gateway to New Horizons; A Journey Into Aviation History)*
3. **NASA Liftoff To Learning** captures the excitement of space flight and explains, in basic and practical terms, the scientific, mathematical and technological concepts that make space flight possible. The 16 episode series also provides concrete examples of the global perspective space flight offers and the new frontiers of research and exploration space flight has created. In essence, NASA astronauts are teaching from space. This program combines the stunning visual images of space flight with clear and entertaining graphics. Each program comes with a printed video resource guide that provides valuable background information for teachers, resources for additional study and practical hands-on demonstrations of concepts presented in the videotapes. *(Exploring Space: The High Frontier)*

- Volume 1 – Space Basics; Go for Eva; Newton in Space; All Systems Go; The Atmosphere Below; and Voyage of Endeavour - Then & Now
- Volume 2 – Toys in Space II; Living in Space; From Undersea to Outer Space; Tethered Satellite & Electrical Circuits in Space; Assignment Spacelab; and Microgravity
- Volume 3 – Geography from Space; The Mathematics of Space –Rendezvous; Let’s Talk Robotics; and Plants in Space

5. **The Many Faces of Old Glory** is a unique and rewarding experience for all who see it. No other program so perfectly combines humor with historic facts about the exciting beginnings of our great country. While showing over 20 flags of great historic significance, Vane Scott will weave the exciting, entertaining and even humorous stories of each into a program that will make you come away a proud and better American. *(Traditions, Wellness, and Foundations of Citizenship)*

6. **Best of Drill Series** is a DVD set that combines an earlier set of two videos provided by Holm Center entitled **Best of Exhibition Drill** and **Best of Basic Drill** and is an updated version of the later 3-DVD set also previously stocked by the Holm Center. Part of this new 6-DVD set is devoted exclusively to exhibition drill, featuring armed and unarmed squad (element) and platoon (flight) performance, as well as interesting armed solo and dual exhibition routines. The rest of the new DVD set features teams performing in unit inspection; regulation drill; and 4-person color guard competition. Armed and unarmed performances are featured within the inspection and regulation competitions, while all color guard performances feature 4-person units performing with 2 rifle bearers and 2 flag bearers. The long hours of practice and attention to detail come to the screen when you watch these exceptional displays of standard, SOP-style drill excellence. There is no need to replace the earlier versions with the newer 6-DVD set, until the older versions become too dated for unit use or becomes damaged. *(Drill and Ceremonies)*

7. **In Real Life - Sexual Harassment** is unwelcome attention of a sexual nature. It's harmful, and it's illegal. Sexual touching, grabbing, pinching or intentionally brushing up against someone in a sexual way -- all of these can be considered harassing behavior. Even obscene comments, looks, teasing and rumors can be forms of harassment. This award-winning video, “In Real Life,” dramatizes the verbal and nonverbal circumstances that can become sexual harassment at school by peers, teachers, and staff. It demonstrates effective ways for students and others to diffuse or stop these occurrences. *(Traditions, Wellness, and Foundations of Citizenship; and Communication, Awareness, and Leadership)*
8. **Credit: You’re in Charge** shows the importance of good credit history, and the secrets to receiving credit. It explores the advantages and disadvantages of credit use. Explores how to choose the form of credit that is right for you. Answers to frequently asked questions concerning educational loans, installment loans, credit cards, and other forms of credit are discussed. Section quizzes and a final quiz help with the retention of information. *(Life Skills and Career Opportunities)*

9. **Money Matters** explains the difference between a want and a need. Gives information on the secrets to a successful budget. Learn the four basic reasons for financial failure and the seven basic laws for accumulation of wealth. Complete understanding of the power of money can lead to smart and successful financial planning. The presentation features section quizzes, a final exam and covers the essentials of astute money management. *(Life Skills and Career Opportunities)*

10. **Warplane: A Century of Fight and Flight** contains four programs. Program I: “Airplane to Air Force.” After their first successful powered flight, the Wright Brothers turned to the US Army, well aware of the potential military value of their airplane. In 1903, with no looming threat of war, the government rejected their $100,000 asking price, but within five years, the entire Western world would embrace the idea of powered flight. World War I ushered in the airplane’s first military roles as armies used planes for aerial reconnaissance, and then for artillery spotting. With aviation still in its infancy, aerial combat took longer to develop, but the evolution of fighter tactics was inevitable as planes became more sky-worthy. By the end of the war, the airplane had been defined as an “eye in the sky”–a role that remains as vital over the deserts of the Middle East today as it was over the trenches of France in 1914. Other titles under Program I include: “The Rotary Engine,” “Airborne Cameras,” and “Synchronized Machine Guns.”

Program II is titled “Air Force to Air Power.” World War II was an era of rapid innovation and terrible destruction from above. From the invention of radar to the birth of the fighter ace, and from Hitler’s blitzkriegs to the bombing of Hiroshima and Nagasaki, this was the period where national air forces came of age, where individual planes coalesced into unstoppable squadrons, and where wartime tactics were dictated from the sky down. Evolving from their roles as spotters, reconnaissance planes transformed into bombers. Germany rained shells down on London, the Allies executed precision bombing raids by day and frightful carpet bombing missions by night. Pathfinders led bomber squadrons to their targets, and fighters protected other planes as they flew. By the time America dropped the atomic bomb – once and for all illustrating the effectiveness of destruction from above – each airplane had its own role, and together, they had made the world a much smaller place to wage war. Other titles under Program II include: “The Bomber”, “The ‘Think Wing’ and the Monoplane,” “Radar,” “The Strategic Bomber,” and “The Superfortress.”

Program III is titled “Jet Power.” Missed opportunities, a vital arms race and the secrets hidden among the spoils of war come vividly to life in this third program of WARPLANE. In the latter days of World War II, Britain and Germany feverishly advanced early dreams of a jet airplane, a defining piece of mid-20th-century technology that would revolutionize existing airplane roles and create an entirely new generation of mission-specific machines. With the world in the grip of the Cold War, combat planes became faster and more agile, spy planes cruised over enemy territory at dizzying heights and dazzling speeds, and jet-powered helicopters entered military service. Designers, test pilots and combat crews took huge risks
as they pushed the technological envelope, and within 58 years of Orville Wright’s historic flight at Kitty Hawk, man had broken through the boundaries of both sound and space. Program III includes “The Jet Engine,” “Supersonic Flight,” “The Helicopter,” “Targeting Systems,” and “The Surface-to-Air Missile.” Program IV is titled “The Spy.” Since World War I, developers have worked endlessly to make planes harder to spot and shoot down. Speed worked at first, then the ability to fly high, but each advance was eventually met by a counter-advance that all but neutralized its. Until, that is, the birth of the computer. With the computer age came avionics – systems to control planes that humans could never fly. These systems, combined with new materials, designs and paints, as well as the unwavering commitment and singular vision of men like Skunk Works’ Ben Rich, gave rise to the most recent revolution in military aviation – stealth planes that are all but invisible to enemy eyes. Like the jet engine before it, stealth technology has transformed warfare, and together with ever-advanced precision ordnance and purely autonomous planes, has positioned the world’s most advanced air forces for a future where in-cockpit pilots may no longer be necessary. Other topics included in Program III are “Fly-by-Wire and the Flight Control Computer,” “Reconnaissance Planes,” “Stealth,” and “Unmanned Aerial Vehicles.” (A Journey Into Aviation History, The Science of Flight: A Gateway to New Horizons; Exploring Space: The High Frontier)

11. 2 Million Minutes focuses on the lack of motivation and preparedness for US students when compared to students in other countries. It takes a deep look at how the three superpowers of the 21st Century - China, India, and the US are preparing students for the future. The DVD gives a “global snapshot” of education from the viewpoint of students. It sends out a signal that “globally” US students are not being prepared to compete with kids from other countries who devote more time and effort to studying; in some cases go to school 6 days a week, and take the tougher courses. It is an interesting film and gives some very alarming statistics. (This DVD can be integrated into any AFJROTC Course)

12. Legion of Valor will introduce cadets to some genuine heroes. It tells the real story of real heroes. The Medal of Honor, the Distinguished Service Cross, the Navy Cross, and the Air Force Cross are medals awarded for acts of extraordinary bravery beyond the call of duty. Organized in 1890, the Legion of Valor is an organization for those who were awarded these medals, and represents fewer than half of one percent of the tens of millions of Americans who have served in the US Armed forces. Follow these stories of heroism as the men who fought with great courage tell them with striking detail. Awarded for their acts of bravery in the face of eminent danger, these men represent the sacrifices of the US Military in its grandest triumphs. These men are legends of valor and their stories are told on this DVD. (A Journey Into Aviation History)

13. The following are free supplemental teacher resources/ DVDs provided by the Pennsylvania Veterans Museum. Contact them directly to obtain the materials (see the CMPF).

a. On Freedom’s Wings – Bound for Glory features the Legacy of the Tuskegee Airmen. During World War II, The Tuskegee Airmen escorted and protected B-17 and B-24 aircraft on 200 bombing missions. Thanks to the heroic efforts and flying skills of the Tuskegee Airmen, not a single bomber was lost to enemy aircraft during those missions. No other WWII fighter group’s performance matched this record. Featured on this DVD are Luther H. Smith, Captain, USAF, Retired, an original Tuskegee airmen; Charles E. McGee, Colonel, USAF, Retired; and Lee “Buddy” Archer, Lieutenant Colonel, USAF, Retired. (A Journey Into Aviation History)
b. **The American Humanitarian Effort** tells the untold veterans’ story of humanitarian efforts during and after the Vietnam War. Most of the troops who served in Vietnam in one way or another played a role in the humanitarian or pacification programs. This is the story of how our troops helped to protect, feed and clothe villagers; how they provided medical treatment to Vietnamese in need, and how they airlifted orphans and fleeing refugees to safety.  

*(A Journey Into Aviation History)*

c. **Their Sacrifice, Our Freedom (WWII in the Pacific).** This documentary, created for the classroom, focuses on soldiers, Marines, and sailors who served valiantly in the Pacific. Hear their stories of friendship, heroism and sacrifice. In their own words, they describe: The Attack on Pearl Harbor; The Battle for Iwo Jima; Attacking Kamikazes and the Surrender Ceremonies in Tokyo Bay. During WW II, American servicemen faced a formidable enemy in the Pacific: the Japanese were well-armed, experienced, and ferocious fighters. “Surrender” was not in their vocabulary – in every engagement with US troops, they fought to the death. When US soldiers and Marines stormed hundreds of beaches in the South Pacific, they would always find the Japanese Army there ahead of them – reinforced and dug in. US sailors aboard ships kept their big guns trained on the sky, to defend against deadly kamikazes. Nearly 52,000 servicemen lost their lives in the Pacific all in the name of freedom.  

*(A Journey Into Aviation History)*

d. **Their Sacrifice, Our Freedom (WWII in Europe).** World War II in Europe claimed millions of lives and changed the landscape of the continent in the early 1940s. The war years also brought many changes to this country and altered the course of human history forever. In this documentary, created especially for students, the focus is on the Pennsylvania soldiers who served so valiantly on the battlefields of Europe. Listen to their stories and learn about the hardships they endured, the friendships they cherished, and the sacrifices they made. Hear them relive combat training, parachuting into France on D-Day, fighting in a fox hole, serving under General S. Patton, and under fire at the Battle of the Bulge.  

*(A Journey Into Aviation History)*

e. **In the Company of Heroes (101st Airborne: Screaming Eagles).** This is the story of “Easy Company,” told by the Pennsylvania Veterans who lived it. They came together as young men, green and untested, at an army training camp in North Carolina. It was 1942, the beginning of WWII. The men of “Easy Company” were part of a new type of soldier. They were paratroopers. They were trained to parachute behind enemy lines and open roads for the Allied army. In this video your students will witness the tough training at Toccoa, the terror of parachute jumping on D-Day; the heroism at Carentan and Market Garden; the bloody winter of Bastogne; and the exultant capture of Hitler’s Eagles’ Nest. Through it all, these combat-hardened soldiers fought side-by-side, first comrades-in-arms, then friends, then finally brothers.  

*(A Journey Into Aviation History)*

f. **Women in the Military.** Since America's founding, women have been driven by patriotic zeal to serve their country, while concurrently pursuing greater economic and social opportunity. From uncommon soldiers who disguised themselves to fight and nurses that faced horrific wounds to those who proudly wear the uniform in battle zones today, women have contributed to our military might in ways unknown to most Americans. This DVD tells their story. It is a tale of pride and love of country; a quest for status and recognition; a journey of dedication to the freedoms we all relish.  

*(A Journey Into Aviation History)*
Leadership Development Requirements (LDRs)

LDR activities include functions and programs cadets help plan, and serve to augment Holm Center Curriculum. LDR activities are AFJROTC sponsored and school approved events normally conducted outside the classroom (before/after school). LDR activities **WILL NOT** replace AFJROTC classroom Aerospace Science and Leadership Education curriculum requirements. These activities are designed to:

1. Acquaint AFJROTC cadets with the importance of the program.
2. Increase cadets’ knowledge of aerospace science and motivate them to attain an even greater knowledge of aerospace science.
3. Employ an interest in the program to enrich the total development of AFJROTC cadets.
4. Provide activities and opportunities for the development of aerospace leadership skills.
5. Inspire interest in related aerospace careers.
6. Contribute to the development of an understanding of aerospace power.
7. Lead to the discovery of the individual educational needs of cadets aspiring to careers in aerospace.

**Leadership Development Requirements (LDR) ONLY Classes**

(Replaces Drill Only Classes)

LDRs are designed to develop cadet leadership and teamwork skills. LDRs provide a needed link between being involved in AFJROTC supported activities and Holm Center provided Curriculum. This may include STEM and/or Activity based LDRs. LDR activities are normally AFJROTC sponsored and school approved events conducted outside the classroom (before/after school). However, with an approved Curriculum Policy waiver LDRs may now be taught as a stand-alone course.

**NOTE:** LDR activities **WILL NOT** replace AFJROTC “Standard” or “Core Credit” curriculum models outlined in the curriculum guide.

LDR courses taught as a **STAND-ALONE** course if the following criteria are met:

- Units **must** define the course in WINGS | Unit Management and submit a curriculum policy waiver request.
  - Defined Course **must** indicate what LDR will be taught.
- Students enrolled in a LDR-only class **must** be concurrently enrolled in a standard JROTC class that includes AS/LE/Wellness.
  - 4x4 block scheduled schools, enrollment in a standard JROTC class during the first block is prerequisite to enrollment in a stand-alone LDR class during the second block.
- The LDR-only class **must** be recognized for graduation credit (elective) by the school.
- The LDR-only class **does not** count toward the unit viability or AFJROTC Certificate of Completion.
Examples of LDR Only Classes (But not limited to this list)

- **Dining-In and Dining-Out (Planning Committee).** A dining-in and dining-out cultivates a spirit of loyalty, pride and enthusiasm. They stimulate cadets’ *morale* and *esprit de corps* and provide experiences in Air Force customs and traditions. The dining-in and dining-out also provides an appropriate setting for recognizing individual and unit achievements. It is important for the success of the dining-in and dining-out that members enjoy the festivities, and those ceremonies are done in a tasteful, dignified manner.

- **Curriculum-In-Action (CIA) (Planning Committee).** CIA school-sponsored activities include field trips to aerospace facilities such as aerospace industries, military museums, NASA, commercial airports, military bases, parades, etc.

- **AFJROTC Aerospace Static Model Program (Aerospace Science STEM Course):** Static Modeling is the designing and/or building of small model rockets or planes. A static model program can provide an exciting introduction for cadets to concepts of aerospace engineering and design.

- **AFJROTC-Air Force Weather Agency Program (Aerospace Science STEM Course):** The AFJROTC-AFWA Program provides a stimulating activity-based program which introduces weather terms, elements, and concepts to AFJROTC cadets. This program enhances the cadets’ knowledge and increases their appreciation for the important role weather plays in the operational world of aviation and safety.

- **Cadet Orientation Flight Program:** The Cadet Orientation Flight Program is designed to introduce cadets to general aviation through hands-on familiarization flights in single-engine aircraft. The program is motivational and should stimulate an interest in general aviation and aerospace activities.

- **Model Rocketry Program (Aerospace Science STEM Course):** Model rocketry is the designing, building, and flying of small rockets that are made of paper, plastic, balsa wood, or any other lightweight material. Model rockets constructed in this manner are approved for use by AFJROTC members.

- **Radio Controlled Aircraft and Quad-Copter Program (Aerospace Science STEM Course):** Radio controlled aircraft are pre-assembled and assembled “ready to fly” kits; the categories include trainer, sport, park flyer, gliders and sailplanes, and quad-copters.

- **Kitty Hawk Air Society (KHAS)** is the official academic honor society of AFJROTC. The society upholds academic standards and promotes further interest in academic achievement. The KHAS is also affiliated with the Air Force Association. Its purpose is to:
  1. Promote high academic standards and achievement,
  2. Promote school and community service,
  4. Develop leadership abilities, recognizes academic excellence, and
  5. Further members’ knowledge of the Air Force role in aerospace.
• **TEEN Community Emergency Response Team (CERT)** is an after school program sponsored by the Federal Emergency Management Agency and a national program of volunteers trained in disaster preparedness and emergency response. Teen CERT training teaches students about the potential disasters that could affect their area and how to safely and responsibly respond to them.

**NOTE:** AFJROTC programs need to address the following concerns prior to implementation of a TEEN CERT program at their school:

- Liability: Who would be responsible for any injuries to students performing in the capacity of an emergency response team member?
- Coordination and approval should be between the AFJROTC unit, parent, principal, and school district/county office of education willing to authorize TEEN CERT at the school site.
- Once approval has been granted and waivers signed by parent/guardian, agreements between the AFJROTC unit, school, district/county office should be renewed on an annual basis.

• **Marksmanship Program** is an after school program where cadets can receive training in marksmanship and the safe handling of an air rifle. Participation is optional and at the discretion of the school administration. Competitions are held to promote training, good sportsmanship, and a high standard of performance in the safe use of an air rifle.

  **NOTE:** For detailed information about these programs, refer to the *AFJROTC Consolidated Operational Supplement* located in WINGS | Menu | Published Files | Directory | JROTC | Operational Supplement.

• **Drill Only Classes** provide the opportunity for AFJROTC units to provide additional drill and ceremonies training and practice for cadets.

• **Raider Challenge** is a very popular athletic competition held within all JROTC programs. The exact raider events vary depending on where you compete, these may involve some type of personal fitness/strength test, distance team running, obstacle course, and some form of rescue/first aid. Other events may include, rope bridge building, land navigation, and mental acuity test.
Aerospace Science courses are taught in four-year sequences. For organizational purposes, there are separate textbooks for these courses and the Leadership Education courses. In practice, however, the overlap is considerable. For example, writing and speaking skills are categorized as “leadership education topics” but can and should be incorporated into the “Aerospace Science” courses. Additionally, many of the Aerospace Science topics will be helpful in the Leadership Education classes.

**Goals for Aerospace Science Courses**

Students will learn about:

1. The development of flight, and civilian and military contributions to aviation.

2. How airplanes fly, how weather conditions affect flight, flight and the human body, and flight navigation.

3. Various cultures through the study of world affairs, regional studies, cultural awareness, people and places, religions, languages, political systems, economics, social issues, environmental concerns, and human rights.

4. The space environment, space exploration, manned and unmanned spaceflight, astronomy, and space technology.

5. The elements of surviving, personal protection, necessities to maintain life, and orientation and traveling.

6. The fundamentals of flight, flight operations, aviation weather, performance and navigation, and integrating pilot knowledge and skills.
# Aerospace Science Courses

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Max Contact Hours (Unless Waived)</th>
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<tbody>
<tr>
<td>Aerospace Science: Milestones in Aviation History 2nd Ed.</td>
<td>72</td>
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<tr>
<td>The Science of Flight: A Gateway to New Horizons</td>
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<tr>
<td>Cultural Studies: An Introduction to Global Awareness</td>
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<tr>
<td>Exploring Space: The High Frontier</td>
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<td>Management of the Cadet Corps</td>
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<tr>
<td>Unmanned Aerial Vehicles (UAVs) / Quadcopter</td>
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<tr>
<td>Model and Remote Control Aircraft</td>
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<tr>
<td>Weather Station “Air Environment”</td>
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<tr>
<td>Astronomy</td>
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<tr>
<td>Flight Simulator</td>
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<tr>
<td>StellarXplorers</td>
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<tr>
<td>CyberPatriot</td>
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<tr>
<td>Introduction to Cybersecurity (CAP)</td>
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<tr>
<td>Cyber Literacy</td>
<td>18</td>
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<tr>
<td>Introduction to Robotics</td>
<td>18</td>
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<tr>
<td>Model Rocketry (Basic)</td>
<td>18</td>
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<tr>
<td>Model Rocketry (Advanced)</td>
<td>18</td>
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Aerospace Science 100: Milestones in Aviation History 2nd Ed.
Published by C² Technologies, Inc.
Aerospace Science 100: Milestones in Aviation History 2nd Ed.

This is the recommended first AS course for all new cadets. It is an aviation history course focusing on the development of flight throughout the centuries. It starts with ancient civilizations and flight, then progresses through time to future developments in aerospace, with an introduction into cyber technologies. The intent of this textbook is to bring alive the significant discoveries in flight a reality. This book tells the story of why we are so proud of our Air Force heritage — laying the foundation for future Air Force JROTC aerospace science courses. Throughout the course 21st century learning is adopted with readings, video clips, hands-on learner centered activities, and chapter project-based learning opportunities.

The Course Outcomes are:

1. Describe historical facts and impacts of the early attempts of heavier-than-air flight.
2. Analyze the impact World War I aviation had on commercial aviation.
3. Examine the role aerial bombing had on the outcome of World War II.
4. Investigate the impact commercial jet aviation has had on US travel.
5. Analyze the lessons learned from global use of US airpower.
6. Evaluate developing technology that will affect the US Air Force of the future.

<table>
<thead>
<tr>
<th>Course</th>
<th>Chapters</th>
<th>Recommended Hours</th>
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<tbody>
<tr>
<td>Chapter 1</td>
<td>Exploring Flight</td>
<td>12</td>
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<td>Chapter 2</td>
<td>Developing Flight</td>
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<td>Chapter 3</td>
<td>Evolution of the Early Air Force</td>
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<td>Chapter 4</td>
<td>Commercial and General Aviation Take Off</td>
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<tr>
<td>Chapter 6</td>
<td>The Modern Air Force</td>
<td>12</td>
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Chapter 1

Exploring Flight

Lesson 1: Ancient Flight

1. Learning Outcome: Examine the contributions of early civilization had on heavier-than-air flight.

2. Learning Objectives:
   a. Describe how humans tried to fly in ancient times.
   b. Explain key aviation devices created during ancient times.
   c. Examine why machines do not fly the way birds do.

Lesson 2: The Early Days of Flight

1. Learning Outcome: Analyze the significant contributions in early developments of flight.

2. Learning Objectives:
   a. Summarize the historical developments of lighter-than-air flight.
   b. Describe the early military contributions of lighter-than-air flight.
   c. Examine the early contributors to heavier-than-air flight.

Lesson 3: The Wright Brothers Take Off

1. Learning Outcome: Summarize the contributions to the development of flight by the Wright Brothers.

2. Learning Objectives:
   a. Describe the Wright Brothers first flight.
   b. Analyze how the principles of airplane flight were applied to the Wright Flyer.
   c. Describe the contributions the Wright brothers made to US Army aviation.
   d. Examine how the Wright brothers were the first to succeed in powered flight.

Lesson 4: Pioneers of Flight

1. Learning Outcome: Examine key contributions of other pioneers of aviation following the Wright Brothers.

2. Learning Objectives:
   a. Describe key individuals and contributions in early aircraft development.
   b. Compare the contributions of early American pioneers in Aviation.
   c. Examine the contributions of women in early aviation.
Chapter In Brief

Chapter One discusses ancient flight through the early pioneers of aviation. It includes the tools and imagination used hundreds of years ago by the Chinese and Leonardo da Vinci’s vision of parachutes and gliders. A lesson on the early days of flight will cover the discovery of how to fly using hot air balloons, early engines to propel dirigibles, and early flight experiments with gliders. This chapter also explores the Wright brothers’ experiments and designs and their systematic approach to be the first to achieve controlled, manned, heavier-than-air, powered flight. The final lesson examines the contributions of early aviation pioneers and the continued development of aircraft and engines.
Chapter 2

Developing Flight

Lesson 1: Airpower in World War I

1. Learning Outcome: Evaluate the significant contributions of air power during World War I.

2. Learning Objectives:
   a. Describe the contributions of Americans pilots during World War I.
   b. Explain how the airplane revolutionized war.
   c. Examine new developments in aviation during World War I.
   d. Explain how war sped up aviation development in the United States

Lesson 2: Expanding the Horizon from Barnstormers to Mainstream

1. Learning Outcome: Analyze how barnstormers contributed to public awareness of aviation.

2. Learning Objectives:
   a. Explain the significance of the term barnstormers.
   b. Name notable pilots who were barnstormers.
   c. Describe significant contributions to aviation made by barnstormers.
   d. Explain how barnstormers changed public opinion of aviation.

Lesson 3: Early Developments in Commercial Flight

1. Learning Outcome: Analyze the significant contributions of the first transatlantic flights.

2. Learning Objectives:
   a. Explain why Lindbergh’s contribution to aviation became famous.
   b. Explain the significance of Amelia Earhart’s transatlantic flights.
   c. Analyze how early developments in aviation benefited commercial aviation.
   d. Describe the introduction of passenger service in aviation.
   e. Explain the consequences of the Airmail Act.
   f. Compare the contributions of aircraft manufactures to commercial aviation.


Chapter In Brief

Chapter two focuses on early days of Army aviation through World War I. You will study how military aviation advanced during World War I, reshaping the way countries would fight future wars. This chapter examines the role barnstormers played in getting America interested in aviation, how Charles Lindbergh captured imaginations with his trans-Atlantic solo flight, and how Amelia Earhart became the first woman to fly across the Atlantic Ocean. You will learn how the development of instrument flying and navigation aids benefited commercial aviation. The chapter ends with an examination of how commercial aircraft builders contributed to the rapid expansion of commercial passenger and air mail services.
Chapter 3

The Evolution of the Early Air Force

Lesson 1: The Army Air Corps

1. Learning Outcome: Analyze the path the Army Air Corps took to independence.

2. Learning Objectives:
   a. Describe the creation of the Army Air Service.
   b. Describe the creation of the Army Air Corps.
   c. Explain the growth of the Army Air Corps.
   d. Identify significant missions flown by the Army Air Corps.
   e. Summarize the rationale of advocates for an independent Air Force.
   f. Summarize the rationale of objectors for an independent Air Force.
   g. Describe the creation of a separate Air Corps Headquarters.

Lesson 2: Airpower in World War II

1. Learning Outcome: Analyze the role aerial bombing had on the outcome of World War II.

2. Learning Objectives:
   a. Explain the strategic role air power played in WWII.
   b. Explain the significance of air power on D-day.
   c. Discuss the role of air power in WWII versus the role of air power in WWI.
   d. Describe the development of strategic air warfare.
   e. Explain the use of formation pattern bombing and combat formation.
   f. Describe significant Allied air campaigns in the European theater.
   g. Describe significant Allied air campaigns in the Pacific theater.

Lesson 3: Significant Aircraft of World War II

1. Learning Outcome: Evaluate the advantages and disadvantages Allied aircraft had against Axis aircraft.

2. Learning Objectives:
   a. Describe the development of bombers during the war.
   b. Describe the development of fighters during the war.
   c. Describe the development of transports during the war.
Chapter In Brief

Chapter three focuses on evolution of the Army Air Corps after World War I through the end of World War II. The first lesson explores the roadblocks the Army Air Corps faced and overcame to establish its own identity, including the court-martial of Brigadier General William “Billy” Mitchell for his harsh criticism of senior military officers. You will also learn about the causes of war during this time and the heroic acts of those who fought the air battles over Europe and Asia.

You will learn about the significance of tactical and strategic air warfare and how it contributed to Allied victory. This chapter explores the challenges of racism that minorities faced during World War II and how they overcame these challenges, establishing a legacy of unwavering patriotism and unmatched aerial dominance. You will learn about the contributions of women in training male aviators and ferrying aircraft to war, even though they were not allowed to participate in combat. The final lesson explores the contributions of military aircraft during World War II and how Allied air superiority helped win the war.
Chapter 4

Commercial and General Aviation Take Off

Lesson 1: The Development of Federal Regulations and Aviation
1. Learning Outcome: Evaluate the impact of federal oversight in aviation.
2. Learning Objectives:
   a. Describe what created the need for regulating aviation.
   b. Describe the organizations that provide oversight of aviation activities.
   c. Discuss the impact regulations had on aviation.
   d. Analyze the impact deregulation has had on commercial aviation.

Lesson 2: The Propeller Era in Commercial Flight
1. Learning Outcome: Analyze the contributions of commercial flight during the propeller era.
2. Learning Objectives:
   a. Discuss the important commercial aircraft of the propeller era.
   b. Review the major commercial airlines of the propeller era.
   c. Explain other developments in commercial airlines’ operations.

Lesson 3: General Aviation Takes Flight
1. Learning Outcome: Analyze the impact of general aviation has had on commercial aviation.
2. Learning Objectives:
   a. Discuss what created the interest for general aviation.
   b. Discuss the different type of aircraft that makes general aviation possible.
   c. Compare the different categories that make up general aviation.

Lesson 4: The Jet Era in Commercial Flight
1. Learning Outcome: Evaluate the impact commercial aviation has had globally.
2. Learning Objectives:
   a. Explain how a jet engine works.
   b. Review developments in jet aircraft.
   c. Summarize the switch to air travel in the United States.
   d. Examine future commercial aircraft.
Chapter In Brief

Chapter four opens with expansion of federal oversight of commercial and general aviation. The introduction of regulations and the organizations that enforce them help make the skies much safer than in the early days of aviation. You will also be given the opportunity to learn about commercial aviation in the early days of flight. How developments in aviation technology positively impacted airlines, opening the door for worldwide expansion of passenger and cargo service.

You will examine how general aviation became a popular method of transportation and the pioneers who built the aircraft. Why the federal ideal of putting an airplane in every garage failed. The final lesson will discuss the founding of the Civil Air Patrol (CAP) and the extraordinary work done by general aviators during World War II. You will also study the different aircraft and categories that make up general aviation.
Chapter 5

The US Air Force is Born

Lesson 1: The Army Air Forces Become the US Air Force


2. Learning Objectives:
   a. Discuss the National Security Act of 1947 and the creation of an independent Air Force.
   b. Explain the Cold War and how it affected US foreign policy and the USAF.
   c. Review the Berlin Airlift and how the USAF helped break the Berlin Blockade

Lesson 2: Military Aircraft Development After World War II

1. Learning Outcome: Evaluate the technology gains made in military aviation after WWII.

2. Learning Objectives:
   a. Examine Aviation Research after WWII.
   b. Discuss significant contributions of test pilots in military aviation.
   c. Analyze other significant military aircraft developed during the Cold War.

Lesson 3: The Role of Airpower from the Korean War to the Vietnam War

1. Learning Outcome: Analyze the strategy of US airpower from the Korean War to the Vietnam War.

2. Learning Objectives:
   a. Analyze how the United States used air power in the Korean War.
   b. Discuss how aircraft were used in the Cuban Missile Crisis.
   c. Evaluate the role of air power in the Vietnam War.
   d. Describe how air-to-air and surface-to-air missile technology changed aerial combat.

Lesson 4: Other US Air Force Military Operations That Supported National Objectives

1. Learning Outcome: Analyze how military operations around the world have supported US national objectives.

2. Learning Objectives:
   a. Evaluate reasons why Operation Eagle Claw failed in Iran.
   b. Examine the lessons learned from Operation Urgent Fury in Grenada.
   c. Examine the outcomes of Operation El Dorado Canyon in Libya.
   d. Discuss what lead to Operation Just Cause in Panama.
   e. Describe how Humanitarian Operations have helped people in need around the world.
   f. Analyze how ending the Cold War has reshaped Eastern Europe.
Lesson 5: Global Interventions from 1990

1. Learning Outcome: Examine the role US airpower from 1990.

2. Learning Objectives:
   a. Examine how the United States used air power in the Operations Desert Shield and Desert Storm.
   b. Discuss the role of air power in Operation Enduring Freedom.
   c. Analyze how air power was applied in Operation Iraqi Freedom.
   d. Describe the role of US air power in other military and humanitarian operations.

Chapter In Brief

Chapter five will start off with why the Army Air Forces transitioned to the US Air Force. You will examine military developments after World War II and how the National Security Act of 1947 paved the way for any independent Air Force and how the Cold War affected US foreign policy and US Air Force priorities. You will also examine the significant contributions of test pilots after World War II and how the dangerous work they accomplished provided data and technology for many of the aircraft flown today.

This chapter also takes an in-depth examination at the role of airpower from the Korean War through the Vietnam War—the aviators and aircraft that were pivotal to each outcome. You will learn about military operations that have been conducted by the US military to protect national interests and provide humanitarian relief. Throughout the chapter aviators who have demonstrated the “Right Stuff” are be highlighted for their bravery and achievements.
Chapter 6

The Modern Air Force

Lesson 1: The Development of Rotary Wing Aircraft

1. Learning Outcome: Analyze the role of helicopter use for military and civilian purposes.

2. Learning Objectives:
   a. Understand the development of early helicopters before World War I.
   b. Summarize further development of helicopters during the 1930s.
   c. Analyze the use of helicopters in US military conflicts.
   d. Examine the helicopter’s expanded role in military and civilian search-and-rescue operations.

Lesson 2: The Significance of Stealth Aircraft

1. Learning Outcome: Examine the significance of stealth aircraft.

2. Learning Objectives:
   a. Describe the development of stealth aircraft.
   b. Describe the development of precision weapons.
   c. Summarize the development of unmanned aerial vehicles (UAVs).

Lesson 3: The Air Force of the Future

1. Learning Outcome: Describe developing technology that will affect the US Air Force of the future.

2. Learning Objectives:
   a. Describe the F-35 Lightening II Joint Strike Fighter, KC-46 Pegasus Aerial Tanker, and B-21 Raider global strike bomber.
   b. Describe current issues of using cyber technology.
   c. Describe current developments in cyberwarfare.

Chapter In Brief

Chapter six begins with the development and evolution of the helicopter from pre-World War I to modern day conflicts and operations. You will explore the role of the helicopter use for military and civilian purposes. As you continue through the chapter you will learn how the use of stealth technology helped create the latest fifth generation of military aircraft and weapons. You will learn how drones and remotely piloted vehicles (RPA) have provided the military a unique multi-mission, medium and high-altitude, long-range, surveillance aircraft.

The final lesson will examine the military aircraft of the future and how they will help the US Air Force maintain air superiority. You will learn about the history cyber technology, the rise of the internet, and the security and privacy issues you face when computing. You will learn about the measures being taken to help define our government and personal information from cyberattacks.
Aerospace Science 200:
The Science of Flight: A Gateway to New Horizons

The Science of Flight: A Gateway to New Horizons is an introductory course and customized textbook that focuses on how airplanes fly, how weather conditions affect flight, flight, flight and the human body, and flight navigation. The course is designed to complement materials taught in math, physics, and other science-related courses and is aligned with the National Science Education Standards, the Math Standards and Expectations, and ISTE National Educational Technology Standards for Students.

In this course, every lesson includes a “Quick Write” and a short story related to the lesson; a “Learn About” that tells students what they’ll learn from the lesson; a list of vocabulary words in the lesson; “Wing Tips” that highlight specific and interesting facts; and facts; and many biographies and profiles. Each lesson closes with “Checkpoints” that will allow students to review what they have learned. An “Applying Your Learning” section at the end of each lesson presents discussion questions that will give them a chance to use what they have learned and provides another way to reinforce their understanding of the lesson’s content. The text has four chapters, each of which contains a number of lessons.

The course outcomes are:
1. Analyze the elements of flight.
2. Evaluate how atmospheric conditions affect flight.
3. Evaluate how flight affects the human body.
4. Analyze flight navigation and the purpose of aerial navigation aids.

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<thead>
<tr>
<th>Course Chapters</th>
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<tbody>
<tr>
<td>Chapter One How Airplanes Fly</td>
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</tr>
<tr>
<td>Chapter Two Working Through Flight Conditions</td>
<td>18</td>
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<tr>
<td>Chapter Three Flight and the Human Body</td>
<td>18</td>
</tr>
<tr>
<td>Chapter Four Flying From Here to There</td>
<td>18</td>
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</tbody>
</table>
Chapter 1: How Airplanes Fly

1. Learning Outcomes

   a. Outline the principles of flight.
   b. Determine the relationship between the four forces of flight and flight stability.
   c. Relate the parts of the airplane to their function in flight.
   d. Analyze aircraft motion and control.
   e. Compare and contrast the types of airplane engines.
   f. Identify the forces that drive the development of aerospace technology.

2. Chapter in Brief

   “Chapter 1: How Airplanes Fly” discusses the elements of flight. Lesson 1 describes the principles of flight, the theory of flight, airfoils, relative wind, and angle of attack. The second lesson looks at the physics of flight and flight’s four forces—lift, weight, thrust, and drag—and flight stability. Lesson 3 explores the various parts of an airplane and the functions each performs. Lesson 4 explains how an airplane moves and how the primary controls work. Lesson 5 compares the different types of aircraft engines and how they work. The last lesson covers aviation research and innovation.

Chapter 2: Working Through Flight Conditions

1. Learning Outcomes

   a. Analyze the atmosphere’s makeup.
   b. Analyze atmospheric components and their effect on weather.
   c. Evaluate the role of weather on air flight.
   d. Forecast stable and unstable conditions for air flight.
   e. Assess the role of meteorology in aviation.

2. Chapter in Brief

   “Chapter 2: Working Through Flight Conditions” explores how weather conditions affect flight. The first lesson analyzes Earth’s atmosphere, atmospheric motion, cloud types and how they form, and how the atmospheric layers impact flight. Lesson 2 looks at air masses and fronts, high and low pressure systems, and terrain factors that affect weather. The third lesson discusses how atmospheric instability, turbulence, and severe weather affect aviation. Lesson 4 covers how meteorologists forecast the weather, the instruments they use, and the various communications types used to provide pilots with weather information. Lesson 5 examines the effects of weather on aircraft—specifically ice formation, microbursts, sandstorms, and wake turbulence.
Chapter 3: Flight and the Human Body

1. Learning Outcomes

   a. Relate the flight environment to the human body.
   b. Analyze the purpose and function of personal protective equipment.
   c. Analyze the four elements of navigation.

2. Chapter in Brief

   “Chapter 3: Flight and the Human Body” covers how flight affects the human body. Lesson 1 discusses the four zones of the flight environment, the physical laws of gases, the respiration and circulation processes, G-forces, spatial disorientation, motion sickness, and other stresses. Lesson 2 describes the protective equipment and aircrew training used by pilots and astronauts and the function and use of flight simulators.

Chapter 4: Flying from Here to There

1. Learning Outcomes

   a. Analyze the four elements of navigation.
   b. Assess the purpose and function of navigational aids.
   c. Relate the role of dead reckoning to navigation.
   d. Distinguish among the primary flight instruments.
   e. Analyze the developments of navigational technology.

2. Chapter in Brief

   “Chapter 4: Flying From Here to There” discusses flight navigation and the purpose of navigational aids. The first lesson explores the elements and history of navigation and navigation instruments, along with direction and chart projections. Lesson 2 looks at navigational aids—clocks, compasses, maps, and air navigation charts—flight planning, and procedures to perform when lost. Lesson 3 explains the principles of dead reckoning, the wind triangle, and inertial navigation systems. The fourth lesson covers the primary flight instruments a pilot uses: the airspeed indicator, altimeter, horizontal situation indicator, and altitude indicator. The final lesson describes the uses of navigation technology using the plotter, dead reckoning computer, radio aids to navigation, global positioning system, and computer flight-planning tools.
Aerospace Science 220:
Cultural Studies: An Introduction to Global Awareness

This is a customized course about the world’s cultures. The course is specifically created for the US Army, Marine Corps, Navy, and Air Force Junior ROTC programs. It introduces students to the world’s cultures through the study of world affairs, regional studies, and cultural awareness. The course delves into history, geography, religions, languages, culture, political systems, economics, social issues, environmental concerns, and human rights. It looks at major events and significant figures that have shaped each region. Throughout the course, there are readings, video segments, hands-on activities, other optional activities, technology enrichment, and assessments to guide in the reinforcement of the materials.

Twenty First Century Skills as defined by the Partnership for 21st Century Skills are integrated into the course. These include learning and innovation (thinking) skills—critical thinking and problem solving, creativity and innovation, and communication and collaboration; information, media and technology skills—information literacy, media literacy, and ICT (information, communications and technology) literacy; and life and career skills—flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility. Again, the content of this course is correlated using the National Geography and Social Studies Standards. These include the National Geography Standards - Geography for Life; and the National Council for the Social Studies (NCSS) standards. In addition, the technology enrichment activities are correlated to the National Education Technology Standards for Students (NETS:S).

The course objectives are:

1. Know how historical, geographic, religious, and ethnic factors have shaped the six major regions of the world.
2. Know how economic, political, and social factors impact cultures.
3. Know how environmental resources influence global economic development.
4. Know how population density, famine, war, and immigration influence the world.
5. Know how the economic systems of communism and capitalism have shaped the six major regions of the world.
6. Comprehend how cultural perspectives of time, space, context, authority, interpersonal relationships, and orientation to community affect interactions among people.
Introduction: What is Global Awareness?

The focus of the introduction is to explain the concept of global awareness and the importance of being aware of global trends. We are living in a global village. Technological advancements, especially in computer hardware and software and fiber options, have reduced the time it requires to communicate across the world. This has resulted in a global economy in which China, India, Pakistan, and other developing nations are now having a major cultural and economic impact on the world. It is essential that we adapt ourselves to the rapid changes in the global economy in order to sustain the social and economic stability in the United States.

Objectives

a. Comprehend how global cultures and interactions impact relationships between different cultural groups.
b. Know the significance of global economics, trade, and markets.
c. Know how the effects of global growth raises environmental concerns over natural resources.
e. Know how changes in technology and education influence the competition for jobs.
Chapter 1: The Middle East

1. Chapter Objectives

   a. Know why the Middle East is viewed as a cradle of western civilization.
   b. Know the characteristics of Judaism, Christianity, and Islam.
   c. Know about changes in the Middle East during the 20th Century.
   d. Know the different groups of people who live in the Middle East.
   e. Know what historical events contributed to the founding of modern Israel.
   f. Know about the historical events associated with the Six-Day War of 1967.
   g. Comprehend how the Yom Kippur War of 1973 affected Arab-Israeli relations.
   h. Know the various attempts at lasting peace in the Middle East.
   i. Know the historical situation of Iraq under the rule of Saddam Hussein.
   j. Know the historical events associated with the 1991 Persian Gulf War.
   k. Know the events surrounding the 2003 US invasion of Iraq.
   l. Know the US attempts to stabilize Iraq since the 2003 invasion.
   m. Know the general impact of terrorism in the world.
   n. Know how radical Islamist beliefs contribute to terrorism.
   o. Know the events associated with the 9/11 attacks and the Global War on Terror.
   p. Know the importance of the production and distribution of oil and energy.
   q. Comprehend how the clash of Middle Eastern and Western cultures affects relationships between people from Middle Eastern and people from Western cultures.
   r. Know the importance of nuclear nonproliferation and the Iranian Issue for the United States.
   s. Know the importance of the water problem in the Middle East.

2. Chapter In Brief

“Chapter 1: The Middle East” reviews the region from its earliest days as the cradle of Western civilization and the birthplace of Judaism, Christianity, and Islam. It then looks at the more recent challenges of war and terrorism. It considers changes the Middle East underwent in the twentieth century and the spread of nuclear weapons there in the twenty-first. Any discussion of this region must include its most sought after natural resource: oil.
Chapter 2: Asia

1. Chapter Objectives

   a. Know the geographic locations of Japan, Korea, China, India, Pakistan, and Afghanistan.
   b. Know the major religions of Asia.
   c. Know the main ethnic groups of Asia.
   d. Know the history of the unitary government and the rule of warlords in China.
   e. Know what caused the shift from isolation to openness in Japan.
   f. Know the impact of domination and division on Korea.
   g. Know the political and economic impact of World War II on China and Japan.
   h. Know that Japan, South Korea, and China have become economic powerhouses.
   i. Know the pre-colonial history of the Mughals in the Indian sub-continent.
   j. Know the encounter with Europe and the colonial period in the region.
   k. Know the history of the struggle for independence in South Asia.
   l. Know what caused the partition and war between India and Pakistan.
   m. Know how Muslim-Hindu strife affects the politics and economics of South Asia.
   n. Know which groups have struggled for control in Afghanistan and why.
   o. Know the impacts of industrialization and pollution in China and India.
   p. Know the interactions between the rich, urban, and the poor rural areas in Asia.
   q. Know the role of women in India, Pakistan, and Afghanistan.
   r. Know China’s one-child policy.
   s. Comprehend the challenges of human trafficking and sex tourism in Asia.
   t. Comprehend the dilemma that North Korea creates for the US.
   u. Know the important issues of nuclear nonproliferation in India and Pakistan.
   v. Comprehend the impacts of global wages, labor, outsourcing, and offshoring in the US.
   w. Know why Asia represents a new target market for US corporations.
   x. Know the effects of Asian imports on the US market and economy.
   y. Comprehend the human rights issues in various Asian nations.

2. Chapter In Brief

“Chapter 2: Asia” begins with a general overview of Eastern religions and the region’s peoples. Students will study Japan, Korea, and China in East Asia, as well as India, Pakistan, and Afghanistan in South Asia. The chapter looks at what unites and what divides these countries. The chapter also tackles Asia’s environmental and social challenges and researches the region’s impact on US security and its economy.
Chapter 3: Africa

1. Chapter Objectives

   a. Know the five major regions of Africa.
   b. Know the natural resources of Africa.
   c. Know the distinctive characteristics of African culture.
   d. Know the main ethno-linguistic groups in Africa.
   e. Know the main language groups in Africa.
   f. Comprehend how Islam, Christianity, and indigenous religions influence Africa.
   g. Know the pre-colonial period of African history.
   h. Know the colonial period of African history.
   i. Know the history and impacts of African independence.
   j. Comprehend how ethnic and sectarian politics undermined democracy in Africa.
   k. Comprehend the tensions between Arabs and Africans in Sudan.
   l. Comprehend the tensions between Hutus and Tutsis in Rwanda.
   m. Comprehend the tensions between Afrikaners, English, and Africans in Zimbabwe and South Africa.
   n. Know the civil wars of Liberia, Sierra Leone, and the Congo.
   o. Know the main health challenges in Africa.
   p. Know the extent and impact of AIDS in Africa.
   q. Know the recurring problems with famine in Africa.
   r. Know the main environmental issues facing Africa.
   s. Know the human rights issues in Africa.
   t. Know the challenges of resources and commerce in the regions of Africa.
   u. Know the immigration trends associated with Africa.
   v. Comprehend the challenges associated with pirating and lawlessness in Somalia.
   w. Comprehend the US and European development efforts in Africa.

2. Chapter In Brief

“Chapter 3: Africa” covers a continent subject to outside influences, from Arab merchants and Islam to European traders and Christianity. Ethnic clashes have long marred the region. Pirates patrol some areas and hinder trade. AIDS, malaria, and other diseases kill thousands each year. Yet Africa is rich with natural resources, such as oil and diamonds, and US and European development agencies are working hard to help. This chapter looks at the area’s potential and what’s being done to encourage it.
Chapter 4: Russia and the Former Soviet Republics

1. Chapter Objectives

   a. Know the geographic locations of Russia and the countries of the former Soviet Republics.
   b. Know the major religious groups of Russia and the former Soviet Republics.
   c. Know the historical context of Russia from the Kievan Rus through the time of Peter the Great.
   d. Know how events from the Nineteenth Century and World War I contributed to the October Revolution.
   e. Know the economic and political impacts of World War II and the Cold War on Russia.
   f. Know the effects of the fall of communism.
   g. Know the characteristics of communism as an economic system.
   h. Know the economic and political influence of Marx, Lenin, and Stalin on communism in Russia.
   i. Know how the Soviet economic system worked and eventually failed.
   j. Know the importance of the export of resources for the restructured Russian economic system.
   k. Know the political and economic influence of Russia on the Ukraine, Belarus, and Moldova.
   l. Know the political and economic influence of Russia on the Baltic States.
   m. Know the political and economic influence of Russia on Armenia, Georgia, and Azerbaijan.
   n. Know the political and economic influence of Russia on Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, and Turkmenistan.
   o. Comprehend the historic relationship between Russia and the United Nations.
   p. Comprehend the historic relationships between Russia and neighboring European nations.
   q. Comprehend the historic relationship between Russia and the three major Asian nations China, Japan, and Korea.
   r. Comprehend the historic relationships between Russia and the United States.
   s. Know the impact of the restructured Russian economic system on worldwide democracy.
   t. Know the Russia-US challenges of nuclear threats, nonproliferation, and missile defense.
   u. Know the impacts on the United States caused by Russian oil production and distribution.
   v. Know the importance of the cooperation in space between Russia and the United States.

2. Chapter In Brief

   “Chapter 4: Russia and the Former Soviet Republics” tracks the Cold War struggle between communism and capitalism. Students will study how the Soviet Union’s economy operated and why it failed. In addition, the chapter deals with Russia’s relationships with Asia, Europe, America, and the United Nations. It also looks ahead to such things as the challenges to US-Russian relations.
Chapter 5: Latin America

1. Chapter Objectives

a. Know the geographic locations of the five major regions of Latin America.
b. Know the major religious groups and languages of Latin America.
c. Know the history before the Spanish conquest and the consequences of the Spanish conquest of Latin America.
d. Know some key historical events associated with Latin America since independence.
e. Know the challenges of the region’s economic systems.
f. Know the challenges related to the political struggle for power.
g. Comprehend how weak governments, corruption, and crime affect economic development.
h. Know about the struggle for power between church and state.
i. Know how free trade agreements have affected the region.
j. Know the key factors that drive and sustain the drug trade.
k. Know how the drug trade undermines local governments and damages economies.
l. Know how the US and local governments have tried to cut off the drug trade.
m. Know how reliance on commodities versus manufactured goods impacts poverty.
n. Comprehend the impact of racial and socioeconomic divisions in Latin America.
o. Know how poor education, urban overcrowding, and high population growth contribute to poverty.
p. Know the challenges of environmental pollution and deforestation.
q. Know the history of US relations with Cuba.
r. Know the history of US relations with Haiti.
s. Know the challenges of migration from Latin America to the United States.
t. Know the effects on the US of the political and economic challenges in Latin America.

2. Chapter In Brief

“Chapter 5: Latin America” reviews the region’s history before and after European conquest. It considers the tug-of-war between church and state, the effects of wide social and economic divisions, and struggles with weak governments and corruption. The chapter also examines the effects of poverty and population growth on the region and its flow of migrants northward.
Chapter 6: Europe

1. Chapter Objectives

   a. Know the geographic locations of the major nations of Europe on a map.
   b. Know how Ancient Greece and the Roman Empire influenced Europe’s development.
   c. Know how Christianity, Islam, and Judaism affected the development of Europe.
   d. Know how nationalism destroyed the continental European empires.
   e. Know how Marxism, socialism, and fascism affected the development of Europe.
   f. Know the origins of the European Union.
   g. Know which countries are members of the European Union.
   h. Know the political and economic structure of the European Union.
   i. Know the importance of the Euro as a world currency.
   j. Know why European countries have permitted immigration.
   k. Know why immigrants have had difficulty assimilating into European societies.
   l. Know the difficulties Al Qaeda and its allies have posed for Europe.
   m. Know the background of ethnic and religious strife in Northern Ireland.
   n. Know how Yugoslavia was created after World War I.
   o. Know how World War II affected Yugoslavia.
   p. Know the role of Josip Broz Tito in uniting Yugoslavia after World War II.
   q. Know how Yugoslavia dissolved into seven independent countries.
   r. Know the history of ethnic cleansing in the Balkans.
   s. Know why the United States intervened in the two world wars and fought the Cold War.
   t. Know the historic purpose and current activities of North Atlantic Treaty Organization (NATO).
   u. Comprehend the importance to the US economy of trade with Europe.
   v. Comprehend the development of human rights and democracy in Eastern Europe following the Soviet Union’s collapse.

2. Chapter In Brief

“Chapter 6: Europe” explains how the ancient Greeks and Romans molded Europe’s character. It shows how their influence eventually extended to the founding principles of the United States. The chapter also delves into Europe’s colonial ambitions, the effects of new nationalism on old empires, and the effects of fascism and communism. The chapter looks in depth at the collapse of Yugoslavia into seven independent countries, and the violence involved. And students will explore the European Union’s history, including its expansion to include countries trying to leave Russia’s sphere of influence.
Exploring Space: The High Frontier

Published by Jones and Bartlett
Aerospace Science 300: Exploring Space: The High Frontier

This is a science course that includes the latest information available in space science and space exploration. The course begins with the study of the space environment from the earliest days of interest in astronomy and early ideas of the heavens, through the Renaissance, and on into modern astronomy. It provides an in-depth study of the Earth, Sun, stars, Moon, and solar system, including the terrestrial and the outer planets. It discusses issues critical to travel in the upper atmosphere such as orbits and trajectories unmanned satellites, and space probes. It investigates the importance of entering space and discusses manned and unmanned space flights, focusing on concepts surrounding spaceflight, space vehicles, launch systems, and space missions. The section on manned spaceflight focuses on the Space Shuttle, space stations and beyond, covering milestones in the endeavor to land on the Moon and to safely orbit humans and crafts for temporary and prolonged periods. The course covers the human aspect of spaceflight, focusing on the human experience in space. It also examines the latest advances in space technology, including robotics in space, the Mars Rover, and commercial uses of space.

All throughout the course are scenarios, video segments, “hands-on” activities and a technology enrichment activity is included in each lesson. As mentioned earlier, the content of this course is correlated using the National Science Education Standards (NSES) and the technology enrichment activities are correlated to the National Educational Technology Standards for Students (NETS.S) standards.

21st Century Skills as defined by the Partnership for 21st Century Skills are also integrated into this course as well. These also include learning and innovation (thinking) skills—critical thinking and problem solving, creativity and innovation, and communication and collaboration; information, media and technology skills—information literacy, media literacy, and ICT (information, communications and technology) literacy; and life and career skills—flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility.

The course objectives are:

1. Know the history of astronomy and the specific characteristics of the Earth, Moon, solar system, and the planets.
2. Comprehend the big picture of space exploration, including the history of spaceflight, organizations doing work in space, and the overall space environment.
3. Comprehend the importance of entering space, characteristics of manned and unmanned spaceflight, and how humans are affected during spaceflight.
4. Comprehend the key concepts for getting from the surface of the Earth into Earth orbit and to other planets and back again.
5. Comprehend how spacecraft, rockets, and launch vehicles are designed and built.
6. Comprehend the latest advances in space technology.
Unit One
The Space Environment

Chapter 1: The History of Astronomy

1. Chapter Objectives
   a. Know about the celestial sphere.
   b. Know about the Greek Earth-centered model.
   c. Know about Ptolemy’s model.
   d. Know about Copernicus and the Sun-centered model.
   e. Know Kepler’s Laws of Planetary Motion.
   f. Know about Galileo and the telescope.
   g. Comprehend Newton’s Laws of motion and gravity.
   h. Know about Einstein and relativity.

2. Chapter In Brief
Chapter 2: The Earth and Moon

1. Chapter Objectives
   a. Know about the Earth’s interior.
   b. Know about Earth’s atmosphere.
   c. Know about the Earth’s Magnetic Field.
   d. Know the Moon’s size and distance from the Earth.
   e. Comprehend the relationships between the Moon and the Earth.
   f. Know about the Moon’s origin and surface.

2. Chapter In Brief

In Chapter 2, “The Earth and Moon” the Earth’s interior is discussed in detail as well as the Earth’s atmosphere and its magnetic field. From space we can see the Earth’s beauty – blue seas, green jungles, red deserts, and white clouds. Much of our appreciation of the Earth comes from knowing that it is home for us and the billions of other living things that share this special and precious corner of the Universe. Lesson 1 covers Earth’s interior and the special characteristics of the Earth and the Moon. The layers of the Earth’s atmosphere are identified and the Van Allen Belts are explained as well as the Earth’s magnetic field. Lesson 2 is titled “The Moon: Earth’s Fellow Traveler”. The Moon is our nearest neighbor in space, a natural satellite orbiting the Earth. It is the frontier of direct human exploration, an outpost that we reached more than a quarter century ago but from which we have since drawn back. But despite our retreat from its surface, the Moon remains of great interest to astronomers. There is much discussion on the Moon’s surface and why astronomers believe so many of its features were carved by impact. The Moon’s size is discussed and the Moon’s distance from the Earth. The relationships between the Moon and the Earth are described and also the Moon’s origin and surface.
Chapter 3: The Sun and the Solar System

1. Chapter Objectives

   a. Know about the Sun’s energy.
   b. Know about the Sun’s core, atmosphere, and sunspots.
   c. Comprehend the Solar System’s structure.
   d. Know about Mercury.
   e. Know about Venus.
   f. Know about Mars.
   g. Know about Jupiter.
   h. Know about Saturn.
   i. Know about Uranus.
   j. Know about Neptune.
   k. Know about Pluto.
   l. Know about the Asteroids.
   m. Know about comets.
   n. Comprehend the Oort Cloud and Kuiper Belt.

2. Chapter In Brief

Chapter 3 is titled “The Sun and the Solar System”. Lesson 1 covers the “Sun and Its Domain” which focuses on the Sun’s energy, the Sun’s core, atmosphere and sunspots, and the Solar System’s structure. There is also discussion on formation of the Solar System. Lesson 2 encompasses the terrestrial planets of Mercury, Venus, and Mars. Each planet is discussed in detail with significant facts given about each planet. In Lesson 3, the outer planets, Jupiter, Saturn, Uranus, and Neptune are discussed. Lesson 4 covers dwarf planets, comets, asteroids, and the Kuiper belt. Pluto’s discovery is discussed in detail as well as its orbit, atmosphere, and moons. Asteroids as well as comets are discussed in detail. Finally, there is discussion of the Oort cloud and the observations that prompted Dutch astronomer, Jan Oort’s hypothesis.
Chapter 4: Deep Space

1. Chapter Objectives

   a. Comprehend the Milky Way Galaxy and the Sun’s place in it.
   b. Comprehend the four components of the Galaxy.
   c. Comprehend other planetary systems.
   d. Comprehend black holes.
   e. Comprehend the center of the Milky Way Galaxy.
   f. Comprehend the other galaxies and their classifications.
   g. Comprehend the five types of space objects.
   h. Comprehend the electromagnetic spectrum.
   i. Comprehend the Big Bang Theory.

2. Chapter In Brief

Chapter 4 “Deep Space” contains 2 lessons titled “The Milky Way Galaxy” and “What Lies Beyond”. The Milky Way Galaxy, talks about the makeup of the Milky Way and the shape of the galaxy. Andromeda, a galaxy similar to the Milky is discussed as well as the Sun’s location in the Milky Way. This chapter also discusses scientists’ new techniques for spotting exoplanets, also known as extrasolar planets. “Black Holes” are discussed with emphasis placed on what a black hole is, the measurements of a black hole, and how scientists detect them. In lesson 2 students will learn how scientists observe the Milky Way Galaxy’s nucleus. We discover that scientists are a long way from understanding the center of the galaxy and need many more observations and much more data to get a clearer picture. There is also discussion about the electromagnetic spectrum and the Big Bang Theory.
Unit Two
Exploring Space

Chapter 5: Exploring, Living, and Working in Space

1. Chapter Objectives
   a. Comprehend the historical benefits of exploration.
   b. Comprehend the US strategic plan to explore space.
   c. Comprehend the current costs of exploring space.
   d. Comprehend the practical benefits of space exploration.
   e. Know how NASA plans and implements space missions.
   f. Comprehend the essential components of a space mission.
   g. Comprehend the selection and training of astronauts.
   h. Know the threat caused by high levels of radiation.
   i. Comprehend the hazard of impact damage to spacecraft.
   j. Comprehend the threats associated with surface landings.
   k. Comprehend fire hazards in space.
   l. Comprehend how microgravity of space travel affects the human body.
   m. Comprehend the threat of radiation to astronauts traveling in space.
   n. Comprehend the study of space biomedicine.

2. Chapter In Brief

Chapter 5 is titled “Exploring, Living, and Working in Space”. Lesson 1 focuses on “why explore space” with emphasis on the historical benefits of space exploration, the US strategic plan to explore space, the current costs of exploring space and the practical benefits of space exploration. The chapter addresses how space exploration strengthens nations. The US vision for space exploration is addressed in detail with discussion on how the International Space Station will advance space exploration as well as the long-term goal of exploring Mars. NASA’s entire budget is discussed in great detail. Many medical breakthroughs have come about from exploring space; these are discussed. Finally, information is given on how the Hubble Space Telescope has aided in the fight against breast cancer.

Chapter discusses NASA’s mission and how space missions are planned and implemented including how the missions and programs are funded. There is discussion on NASA’s four principal directorates and the duties of each. Finally, the selection and training of astronauts is discussed.

Cadets will learn about the threat caused by high levels of radiation focusing on the threat of solar storms to spacecraft in high orbit and how radiation can damage machines and cause computer failure in space. The lesson talks about how NASA studies different materials to determine which ones hold out best against the radiation in space.

Chapter explores how to make space people friendly with discussions on how microgravity of space travel affects the human body, the threat of radiation to astronauts traveling in space and the study of space biomedicine. The benefits of space biomedical research for health on Earth are discussed. There is focus on the many useful technologies that have already come from space exploration.
Chapter 6: Space Programs

1. Chapter Objectives:
   a. Comprehend the history and accomplishments of Project Mercury.
   b. Comprehend the history and accomplishments of Project Gemini.
   c. Comprehend the history and accomplishments of Project Apollo.
   d. Comprehend the history and accomplishments of the Russian Vostok project.
   e. Comprehend the history and accomplishments of the Russian Voskhod project.
   f. Comprehend the history and accomplishments of the Russian Soyuz project.
   g. Comprehend the history and accomplishments of the Chinese Space program.
   h. Comprehend the history and accomplishments of the Indian Space program.
   i. Comprehend the history and accomplishments of the European Space program.
   j. Comprehend the history and accomplishments of the Japanese Space program.

2. Chapter In Brief

In Chapter 6, lesson 1 “The US Manned Space Program” begins with discussion about the US manned space program including the history and accomplishments of Projects Mercury, Gemini, and Apollo. Special recognition is given to Alan B. Shepard, John Glenn, Ed White, and Neil Armstrong. The six manned missions of the Mercury 7 are highlighted. In lesson 2, “The Soviet/Russian Manned Space Program”, the Soviet and Russian Manned Space programs are discussed in great detail including the history and accomplishments of the Russian Vostok project, the history and accomplishments of the Russian Voskhod project, and the history and accomplishments of the Russian Soyuz project. Finally in lesson 3 “Space Programs around the World”, there is discussion about space programs around the world to include the history and accomplishments of the Chinese, Indian, European, and Japanese space programs.
Chapter 7: The Space Shuttle

1. Chapter Objectives
   a. Comprehend why the space shuttle was developed.
   b. Comprehend the space shuttle’s main features.
   c. Comprehend the shuttle’s legacy.
   d. Comprehend the Challenger accident.
   e. Comprehend the Columbia accident.

2. Chapter In Brief

Chapter 7 will acquaint the students with the space shuttle and the lessons learned from the Challenger and Columbia accidents. Lesson 1, “The Space Shuttle” begins with an in-depth coverage of the space shuttle to include why the shuttle was developed and a discussion of the original six orbiters and how they came about. The main features of the space shuttle are covered in detail. Focus is placed on the shuttle’s legacy. Several “shuttle firsts” are highlighted. The Challenger and Columbia accidents are discussed in Lesson 2. Highlighted are changes NASA has made to reduce the possibility of other accidents.

Chapter 8: Space Stations and Beyond

1. Chapter Objectives
   a. Comprehend the Salyut space station.
   b. Comprehend the Skylab space station.
   c. Comprehend the Mir space station.
   d. Comprehend the International Space Station.
   e. Comprehend the planned return trip to the Moon.
   f. Comprehend the plans for a Moon outpost.
   g. Comprehend the plans for a manned mission to Mars.

2. Chapter In Brief

Chapter 8 focuses on space stations and our future in space. Covered in lesson 1, “From Salyut to the International Space Station” are the Salyut, Skylab, Mir, and International Space Stations. The main purpose of each space station as well as experiments and research conducted from each are highlighted. Construction of the International Space Station (ISS) is covered and the lesson depicts how nations are working together to construct the space station. Several ISS astronauts are featured. Lesson 2 examines our future in space describing the planned return trip to the Moon, the plans for a Moon outpost, and the plans for a manned mission to Mars. Several benefits from Lunar exploration are given with an explanation of each benefit. New technologies to support missions to the Moon and Mars are discussed in detail.
Chapter 9: The Unmanned Missions of Space Probes

1. Chapter Objectives

   a. Comprehend the spacecraft that have studied the Sun.
   b. Comprehend the unmanned exploration of the Moon.
   c. Comprehend the unmanned exploration of Venus.
   d. Comprehend the unmanned exploration of Mars.
   e. Comprehend how the Hubble Space Telescope aids the exploration of space.
   f. Comprehend scientific discoveries among the outer planets.
   g. Comprehend the scientific investigation of comets and asteroids.

2. Chapter In Brief

   Chapter 9 is titled “The Unmanned Missions of Space Probes”. Lesson 1 examines missions to the Sun, Moon, Venus, and Mars and the Hubble space telescope and missions to comets and the outer planets. There are discussions about spacecraft that have studied the Sun including focus on Pioneer 7, Ulysses, and Hinode. Before either a return to the Moon or a mission to Mars can become a reality, scientists need to learn more about the topography, resources, and varying temperatures on the Moon. To help in this quest, NASA has launched the Lunar Reconnaissance Orbiter and the Lunar Crater Observation and Sensing Satellite. Both are discussed along with their findings. There is detailed discussion about the unmanned explorations of Venus and Mars and their findings. In lesson 2 there is discussion about the Hubble Space Telescope (HST) and how it aids the exploration of space. Highlighted is the history and significant findings of the HST. Scientific discoveries among the outer planets are discussed. The missions to explore asteroids and comets are covered.
Chapter 10: Orbits and Trajectories

1. Chapter Objectives

   a. Comprehend how orbits work.
   b. Comprehend the different types of orbits used for different purposes.
   c. Comprehend trajectories in space travel.
   d. Comprehend maneuvering in space.
   e. Comprehend navigation data.

2. Chapter In Brief

Chapter 10 will acquaint students with orbits and trajectories. In lesson 1 “Orbits and How They Work” students will learn about orbits and how they work. Basic tools for analyzing orbits are explored. We have tried to keep this chapter simple so as not to confuse the students. But, understanding orbits can give a clear view into the future; that is, once an object’s position and speed are known, plus the features of the gravity field it is in, scientists can predict where the object will be minutes, hours, or even years from now. Such topics as momentum and gravitational force, orbital velocity, and how height, eccentricity, and inclination affect an orbit are discussed. In lesson 2 “Maneuvering and Traveling in Space”, there is discussion about the different types of orbits and the different purposes of each. This lesson looks at trajectories in space travel, the different types of trajectories maneuvering in space, and navigation data which includes a spacecraft’s velocity, distance, and angular measurements.
Chapter 11: Rockets and Launch Vehicles

1. Chapter Objectives

a. Comprehend the history and principles of rocket science.
b. Comprehend the different types of rockets.
c. Comprehend the propulsion and flight of rockets.
d. Comprehend the evolution of rocket technology.
e. Comprehend the types of launch vehicles.
f. Comprehend the factors and features of a rocket launch.

2. Chapter In Brief

In Chapter 11 “Rockets and Launch Vehicles” lesson 1, titled “It is Rocket Science: How Rockets Work” examines the history and principles of rocket science to include how rockets operate and how force, mass, and acceleration apply to rockets. The importance of thrust for rocket flight is illustrated. The different types of rockets are talked about to include air rockets, bottle rockets and model rockets. There is also information on how solid and liquid propellant rocket engines work. Lesson 2, “Propulsion and Launch Vehicles” explores the evolution of rocket technology and includes the study of the early use of rockets and the early rocket scientists. The students will get acquainted with the contributions of various modern rocket scientists. Students will study about the different types of launch vehicles for the United States and other countries. This lesson covers launch sites, launch windows, and how NASA prepares for a launch.

Chapter 12: Robotics in Space

1. Chapter Objectives

a. Comprehend the purpose of using robots in space.
b. Comprehend the history of robots in space.
c. Comprehend the current robotic missions in space.
d. Comprehend the history of the Mars Rover Expedition.
e. Comprehend the results of the Mars Rover Expedition.
f. Comprehend the goals for future rover expeditions.

2. Chapter In Brief

Chapter 12 lesson 1, “Developing Robots for Space”, examines the purpose of using robots in space. NASA uses robots to explore the Solar System in ways humans often cannot. There is in-depth discussion on the use of robotic arms in space and how robots help astronauts and scientists investigate new worlds. There is also discussion on how NASA is constantly working to improve its field of robots and at the same time keep up with new advances in technology. The history of robots in space is explained. More recent achievements of robots in space are examined as well as current robotic missions in space. This lesson ends with discussion on the advantages and disadvantages of using robots instead of humans in space. Lesson 2, “The Mars Rover and Beyond”, explores the history of the “Mars Rover Expedition”. There is discussion on Spirit and Opportunity and the challenges of the flight to Mars. Focus is given to the science goals of the Mars exploration program. The lesson concludes by calling attention to the goals of the future rover expeditions.
Chapter 13: Commercial Use of Space

1. Chapter Objectives

   a. Comprehend commercial satellites and launches.
   b. Comprehend the possibility of space tourism.
   c. Comprehend the potential of mining asteroids and moons.
   d. Comprehend how people use satellites every day.
   e. Comprehend the uses of global positioning system.
   f. Comprehend how NASA shares its inventions with the private sector.

2. Chapter In Brief

Chapter 13, lesson 1 begins with discussion on commercial satellites and launches. It points out that when the earthquakes hit Haiti and Chile in 2010, people around the world instantly saw images of the destruction. Students will learn how satellites have changed the way much of the world operates which has in turn transformed the way the world communicates. The satellite development of RCA, AT&T, and the Hughes Aircraft company is discussed along with the commercial use of communications satellites. Students will become acquainted with NASA’s commercial launches. Because of the growing interest in space travel, space tourism is talked about. The lesson concludes with discussion about the potential of mining asteroids and moons. Lesson 2, “Space in Your Daily Life”, talks about space in your daily life and how satellite technology helps make it all possible including tweeting from space, the use of satellite images during evening weather reports and the use of direct-broadcast satellites. There is focus on the uses of a Global Positioning System. There is much discussion on how Global Positioning Systems (GPS) use space technology, how Internet mapping programs use GPS images, and how people use GPS technology while driving. Students will learn about the goals of NASA’s innovative partnership program and the NASA publication “Spinoff”. Students will about how products developed for NASA have benefited society.
Aerospace Science 400: Management of the Cadet Corps

The cadets should be in a leadership position of managing cadet corps programs by their fourth year in the Air Force Junior ROTC program. Not every leadership position needs to be held by fourth year cadets and AS 400 is intended for 4th year cadets who hold corps management positions. However, if necessary due to low number of 4th year cadets, 3rd year cadets may be placed in corps management positions and enrolled in AS 400. AS 400 is not intended for cadets who do not hold corps management/leadership positions and instructors should ensure only those cadets holding corps management/leadership positions are enrolled in the course. This hands-on experience affords cadets the opportunity to put theories of previous leadership courses into practice. Planning, organizing, coordinating, directing, controlling, and decision-making will be done by cadets. They will put into practice their communication, decision-making, personal-interaction, managerial, and organizational skills. Instructors should keep in mind that since there is no textbook for this course, the course syllabus will be structured so that cadets achieve course objectives by completing corps management activities.
The course objectives are:

1. Apply theories and techniques learned in previous leadership courses.

2. Analyze how to develop leadership and management competency through participation.

3. Analyze strengthened organizational skills through active incorporation.

4. Evaluate how to develop confidence in ability by exercising decision-making skills.

5. Evaluate Air Force standards, discipline, and conduct.

### Aerospace Science: Management of the Cadet Corps

<table>
<thead>
<tr>
<th>Course Units</th>
<th>Recommended Hours</th>
</tr>
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<tbody>
<tr>
<td>400a</td>
<td>Management of the Corps</td>
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<tr>
<td>400b</td>
<td>Management of the Corps</td>
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<td>400c</td>
<td>Management of the Corps</td>
</tr>
<tr>
<td>400d</td>
<td>Management of the Corps</td>
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</table>
Survive • Return
By AFJROTC Curriculum
Aerospace Science 410: Survival: Survive • Return

The *Survival* text is a synthesis of the basic survival information found in Air Force Regulation 64-4 *Survival Training*. The survival instruction will provide training in skills, knowledge, and attitudes necessary to successfully perform fundamental tasks needed for survival. Survival also presents “good to know” information that would be useful in any situation. The information is just as useful to an individual lost hunting or stranded in a snowstorm. Sample lesson plans and power point slides can be found at:

• WINGS | Menu | Published Files | Directory | JROTC | AFJROTC Curriculum | Survival.

The course objectives are:

1. Know the elements of surviving.

2. Know how medicine procedures, clothing, and shelter can provide personal protection for a survivor in a survival situation.

3. Know the necessities for maintaining life in a survival situation.

4. Know how to travel and prepare for recovery in a survival situation.

### Survival: Survive • Return

<table>
<thead>
<tr>
<th>Course Units</th>
<th>Recommended Hours</th>
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</thead>
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<tr>
<td>Unit One  The Elements of Surviving</td>
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<tr>
<td>Unit Two  Personal Protection</td>
<td>18</td>
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<tr>
<td>Unit Three Necessities to Maintain Life</td>
<td>18</td>
</tr>
<tr>
<td>Unit Four Orientation and Traveling</td>
<td>18</td>
</tr>
</tbody>
</table>
Unit One

The Elements of Surviving

Chapter 1-1: Survival Preparedness

Chapter Objective

Know how to survive in situations where your safety and life depends on your decisions.

Chapter 1-2: Conditions Affecting Survival

Chapter Objective

Know the three basic conditions affecting survival.

Chapter 1-3: The Survivor's Needs

Chapter Objective

Know that the two fundamental goals of a survivor are maintaining life and returning.

Chapter 1-4: Psychological Aspects of Survival

Chapter Objective

Know that coping with the psychological aspects of survival is a key ingredient in any survival situation.

Chapter 1-5: The Will to Survive

Chapter Objective

Know the importance of having the will to survive in hopeless situations.
Unit Two

Personal Protection

Chapter 2-1: Basic Survival Medicine

Chapter Objective

Know basic survival medicine procedures, treatments, and prevention measures when faced with medical encounters.

Chapter 2-2: Plants for Medicine

Chapter Objective

Know how to use plants for medicine.

Chapter 2-3: Proper Body Temperature

Chapter Objective

Know the proper body temperature.

Chapter 2-4: Clothing

Chapter Objective

Know that clothing is an important asset to survivors.

Chapter 2-5: Shelters

Chapter Objective

Know how the environment influences shelter sites and what factors to consider before constructing the shelter.
Unit Three
Necessities to Maintain Life

Chapter 3-1: Firecraft

Chapter Objective
Know how to build, design, and light a fire when in a survival situation.

Chapter 3-2: Equipment

Chapter Objective
Know how to care for and use issued equipment and improvise when the needed equipment is not available.

Chapter 3-3: Food

Chapter Objective
Know that a survivor must meet his body needs through the intake of food.

Chapter 3-4: Survival Use of Plants

Chapter Objective
Know the types of plants you can eat in a survival situation.

Chapter 3-5: Water

Chapter Objective
Know how to locate, procure, purify, and store water.
Unit Four
Orientation and Traveling

Chapter 4-1: Land Navigation

Chapter Objective
Know how to use a map and compass.

Chapter 4-2: Navigation Using the Sun and the Stars

Chapter Objective
Know how to use the Sun and the stars to determine direction.

Chapter 4-3: Land Travel

Chapter Objective
Know if land travel is or is not a necessity in a survival situation.

Chapter 4-4: Signaling Techniques

Chapter Objective
Know how survivors can assist in their own recovery with signaling techniques.

Chapter 4-5: Recovery Principles

Chapter Objective
Know recovery principles.
Aerospace Science 500: Aviation Honors Ground School

This course is the foundation for students interested in receiving a private pilot’s license. The material covered is an advanced, more in-depth study of aerospace topics. Aviation Ground Honors School (AHGS) is taught as the Aerospace Science component of an AFJROTC class. Since AHGS should be taught as a “honors” class, instructors may define this course in WINGS using the 60%-40% AS/LE mix.

Submitting Waiver to Teach AHGS

AHGS should only be taught by AFJROTC instructors who hold appropriate Basic Ground Instructor (BGI), FAA Certified Flight Instructor (CFI) certificates, or Air Force Form 8’s indicating primary aircrew instructor/evaluator experience. All JROTC programs wishing to teach AHGS program must first define the course as intended to teach and then request approval from Holm Center/DEJ via WINGS | Unit Management | Unit Defined Courses | Request content waiver for this course. When submitting waiver requests instructors will need to ensure they attach appropriate documents indicating they are qualified to teach the course. AHGS requests are granted based on military and/or civilian experience. Instructors teaching the AHGS course with only AF Form 8’s to indicate qualification will still need to have a FAA certified ground or flight instructor sign off that the cadet has received the required ground school training before cadet will be allowed to take exam. Qualified/certified instructors who are not AFJROTC staff members may teach ground school classes at an AFJROTC unit, if a waiver has been approved for the unit by Holm Center/DEJ.

The intent of the program is to provide AFJROTC an academically challenging course for top achievers in the AFJROTC program. Entry into ground school should be earned by high achievement in other AFJROTC courses and involvement in the cadet corps. The course should receive “honors” (i.e. advanced) credit and must have approval of principal. The student must have written approval from the SASI/ASI prior to registering and must be a junior or senior honor student who has demonstrated potential and aptitude; in addition the student must have successfully completed a minimum of 2 years of AFJROTC coursework (to include AS 200: The Science of Flight: A Gateway to New Horizons and maintained a grade of C or better.

When the course is completed students should be prepared to take and pass the Federal Aviation Administration (FAA) written examination per requirement of the Federal Aviation Regulations FAR 61-05 Section 61.3. Upon completion of the appropriate exam for the ground school course, the instructor will request Ground School Certificate badges from HQ Holm Center/JROL.

The Private Pilot Manual is the primary source for initial study and review. The text contains complete and concise explanations of the fundamental concepts and ideas that every private pilot needs to know. The subjects are organized in a logical manner to build upon previously introduced topics. Subjects are often expanded upon through the use of Discovery Insets, which are strategically placed throughout the chapters. Periodically, human factor principles are presented in Human Element Insets to help you understand how your mind and body function while you fly. Throughout the manual, concepts that directly relate to FAA test questions are highlighted by FAA Question Insets. Additionally, you can evaluate your understanding of material introduced in a particular section by completing the associated review questions.
Electronic copies of FAA’s *The Pilot’s Handbook of Aeronautical Knowledge* may be downloaded from: [https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/pilot_handbook.pdf](https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/pilot_handbook.pdf)

**The course objectives are:**

1. Comprehend the fundamentals of flight.
2. Comprehend flight operations.
3. Comprehend the atmosphere and its effect on aircraft operations.
4. Comprehend the basics of navigation using charts and radio aids.
5. Apply the principles of aeronautical decision-making and flight-related physiological factors.
Part I
Fundamentals of Flight

Chapter 1: Discovering Aviation

1. Chapter Objectives
   a. Recall the pilot training process.
   b. Describe aviation careers that available.
   c. Analyze the different pilot ratings and certificates that may be added to a basic private pilot certificate.
   d. Evaluate the role of crew resource management (CRM) in safe aircraft operation.
   e. Recall how human factors affect aircraft operation.

2. Academic Content
   Section A – Pilot Training
   Section B – Aviation Opportunities
   Section C – Introduction to Human Factors

3. Completion Standards
   The student will demonstrate, through written or oral assessment, understanding of pilot training programs and policies, opportunities in aviation, and human factors and flight operations.

4. Part I Overview
   Although we have never been able to duplicate the skill of birds, we have mastered the art of flying in our own unique way. We have built flying vehicles to transport us from town to town, coast to coast, around the world, and into space. As you explore Part I, you will begin to understand not only why we endeavor to fly, but also how the goal of flight is achieved. Discovering Aviation answers your questions about the pilot training process and introduces you to the world of aviation. You will discover how the components of the airplane operate in Airplane Systems, and as you examine Aerodynamic Principles, you will gain knowledge of the forces acting on an airplane in flight.
Chapter 2: Airplane Systems

1. Chapter Objectives
   a. Describe the aircraft components and their purpose.
   b. Examine aircraft power plant and related systems.
   c. Describe flight instrument functions and operating characteristics, including errors and common malfunctions.

2. Academic Content
   Section A – Airplanes
   Section B – The Power plant and Related Systems
   Section C – Flight Instruments

3. Completion Standards
   The student must demonstrate satisfactory understanding during oral assessment administered by the instructor at completion of lesson.
   Student will also complete Chapter 2 questions for Section A, B, and C with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progression to Chapter 3.

Chapter 3: Aerodynamic Principles

1. Chapter Objectives
   a. Define the four forces of flight, aerodynamic laws of motion, and principles of airfoil design.
   b. Describe the effect of the three axes of flight on aircraft controllability and stability.
   c. Analyze the interaction of lateral and directional stability in safe aircraft operation.
   d. Examine stall/spin variable as they relate to takeoff, flight, and landing.
   e. Describe the importance of prompt recognition of stall indications.

2. Academic Content
   Section A – Four Forces of Flight
   Section B – Stability
   Section C – Aerodynamics of Maneuvering Flight

3. Completion Standards
   The student must demonstrate satisfactory understanding during oral assessment administered by the instructor at completion of lesson. Cadet will also complete Chapter 3 questions for Sections A, B, and C with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progression to Chapter 4.
Part II
Flight Operations

Chapter 4: The Flight Environment

1. Chapter Objectives
   a. Describe important safety considerations, including collision avoidance precautions, right-of-way rules, and minimum safe altitudes.
   b. Identify airport runway marking and lighting, aeronautical charts, and types of airspace.
   c. Recall collision avoidance procedures and runway incursion avoidance.

2. Academic Content
   Section A – Safety of Flight
   Section B – Airports
   Section C – Aeronautical Charts
   Section D – Airspace

3. Completion Standards
   The student must demonstrate understanding during oral quizzing by the instructor at completion of lesson.

   Student completes Chapter 4 question for Sections A, B, C, and D with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progression to Chapter 5.

4. Part II Overview
   In the early days of aviation, there were few airplanes and even fewer airports. At the busiest airports, the amount of air traffic was negligible compared to today. As air traffic grew, pilots became aware of the increased potential for midair collisions; airports evolved to manage many aircraft at once; airspace designations were created to govern the operation of aircraft; and common radio procedures were established to enhance communication. Part II contains a broad range of information that you need to operate safely in today’s complex flight environment. The rules and procedures, which make it possible for thousands of aircraft to efficiently takeoff and land each day are examined in Chapter 4, The Flight Environment. As you explore Chapter 5, Communication and Flight Information you will discover how to effectively communicate with air traffic control and you will learn about the various sources, which provide you with information essential to flight operations.
Chapter 5: Communication and Flight Information

1. Chapter Objectives
   a. Recall radar, transponder operations, and FAA radar equipment, and services for VFR aircraft.
   b. Describe types of services provided by Flight Service Stations (FSS).
   c. Demonstrate how to use the aircraft radio for effective communication.
   d. Describe sources of flight information, particularly the *Aeronautical Information Manual* and FAA advisory circulars.

2. Academic Content
   Section A – Radar and ATC Services
   Section B – Radio Procedures
   Section C – Sources of Flight Information

3. Completion Standards
   The student must demonstrate understanding during oral quizzing by the instructor at completion of lesson. Student completes Chapter 5 questions for Sections A, B, and C with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progression to the Stage Exam in Ground Lesson 6.

Part III
Aviation Weather

Chapter 6: Meteorology for Pilots

1. Chapter Objectives
   a. Analyze the causes of various weather conditions, frontal systems, and hazardous weather phenomena.
   b. Recall how to recognize critical weather situations from the ground and during flight, including hazards associated with thunderstorms.
   c. Describe recognition and avoidance of wind shear and wake turbulence.

2. Academic Content
   Section A – Basic Weather Theory
   Section B – Weather Patterns
   Section C – Weather Hazards
3. Completion Standards

The student must demonstrate understanding during oral quizzing by the instructor at completion of the lesson. Student completes Chapter 6 questions for Sections A, B, and C with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progression to Ground Lesson 8.

4. Part III Overview

It is one of the largest variables affecting any flight yet its fickle nature is one of the things that make flying so challenging and exciting. It, of course, is the atmosphere and the weather, which occurs within it. The information in Part III will provide you with the tools necessary to ensure that your flights in the ever-changing atmosphere are safe and enjoyable. In Chapter 6, Meteorology for Pilots, you will discover how weather forms and how its hazards can affect aircraft operations. In Chapter 7, you will analyze Graphic Reports and Forecasts and you will unlock the mystery of how meteorologists formulate weather forecasts. Then, you will see how those forecasts, and the current weather on which they are based, is presented and disseminated to pilots.

Chapter 7: Interpreting Weather Data Ground

1. Chapter Objectives

a. Describe how to obtain and interpret weather reports, formats, and graphic charts.
b. Recall sources of weather information during preflight planning and while in flight.
c. Recognize critical weather situations described by weather reports and forecasts.

2. Academic Content

Section A – The Forecasting Process
Section B – Printed Reports and Forecasts
Section C – Graphic Weather Products
Section D – Sources of Weather Information

3. Completion Standards

The student must demonstrate understanding during oral quizzing by the instructor at completion of lesson. Student completes Chapter 7 questions for Sections A, B, C, and D with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progressing to the Stage II Exam.
Part IV
Performance and Navigation

Chapter 8: Airplane Performance

1. Chapter Objectives
   a. Describe how to use data supplied by the manufacturer to predict airplane performance, including takeoff and landing distances and fuel requirements.
   b. Analyze the effects of density altitude on takeoff and climb performance.
   c. Compute and control the weight and balance condition of a typical training airplane.
   d. Demonstrate basic functions of flight computers.

2. Academic Content
   Section A – Predicting Performance
   Section B – Weight and Balance
   Section C – Flight Computers

3. Completion Standards
   The student must demonstrate understanding during oral quizzing by the instructor at completion of lesson. Student completes Chapter 8 questions for Sections A, B, and C with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progressing to Ground Lesson 12.

4. Part IV Overview
   The preflight preparations for a space mission are complex and detailed. Without dozens of technicians and engineers calculating performance and navigation data, successful space-flight would be virtually impossible. While the preflight preparations of general aviation pilots are less visible, they are no less important. Part IV introduces techniques, which not only reduce your workload in the air, but also result in a safer, more enjoyable flight. Chapter 8, Airplane Performance will show you how to get the most out of your airplane, whether that means the most speed or the most economy, the shortest takeoffs or the longest range. In Chapter 9, Navigation you will learn to find your way from place to place using some of the latest technology, as well as the old and reliable techniques that will never go out of date.
Chapter 9: Navigation

1. Chapter Objectives
   a. Demonstrate basic concepts for VFR navigation using pilotage, dead reckoning, and aircraft navigation systems.
   b. Describe guidelines and recommended procedures related to flight planning, use of an FAA Flight Plan, VFR cruising altitudes, and lost procedures.
   c. Recall advanced navigation using area, long range, and global navigation systems.

2. Academic Content
   - Section A – Pilotage and Dead Reckoning
   - Section B – VOR Navigation
   - Section C – ADF Navigation
   - Section D – Advanced Navigation

3. Completion Standards
   The student must demonstrate understanding during oral quizzing by the instructor at completion of lesson. Student completes Chapter 9 questions for Sections A, B, C, and D with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progressing to Ground Lesson 13.

Part V
Integrating Pilot Knowledge and Skills

Chapter 10: Applying Human Factor Principles

1. Chapter Objectives
   a. Examine important aviation physiological factors as they relate to private pilot operations.
   b. Analyze accepted procedures and concepts pertaining to aeronautical decision making and judgment, including cockpit resource management and human factors training.

2. Academic Content
   - Section A – Aviation Physiology
   - Section B – Aeronautical Decision Making
3. Completion Standards

The student must demonstrate understanding during oral quizzing by the instructor at completion of lesson. Student completes Chapter 10 questions for Section A and B with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progressing to Ground Lesson 14.

4. Part V Overview

Without knowledge and skill, the art of flying can never truly be mastered. You must apply the knowledge you have gained while exploring this manual with the skills you have acquired in the cockpit. Part V is designed to help you complete the journey toward your private pilot certificate by integrating the various elements you have already learned. Chapter 10, Applying Human Factors Principles, helps you to improve your judgment as pilot in command by increasing your knowledge of human factors concepts, such as aviation physiology and aeronautical decision-making. Chapter 11, Flying Cross-Country, presents a flight scenario, which provides a unique opportunity to examine pilot decision-making.

Chapter 11: Flying Cross-Country

1. Chapter Objectives
   a. Describe the planning process for a cross-country flight.
   b. Examine flying a typical cross-country flight, including evaluation of in-flight weather and decisions for alternative actions, such as a diversion.
   c. Demonstrate how to evaluate and plan for alternatives.

2. Academic Content
   Section A – The Flight Planning Process
   Section B – The Flight

3. Completion Standards

The student must demonstrate understanding during oral quizzing by the instructor at completion of lesson. Student completes Chapter 11 questions for Section A and B with a minimum passing score of 80%. Instructor reviews incorrect responses to ensure complete student understanding prior to progressing to the Stage III Exam.
Aerospace Science 510:
AFJROTC Honors Senior Project

This project is provided for those units who have students that want to continue on in AFJROTC during their senior year and receive honors credit. It will allow top cadets to earn Honors Credit for a more demanding version of “Management of the Cadet Corps” allowing cadets the opportunity to improve their leadership, management, and organizational skills.

This culminating honors project is designed for cadets to demonstrate essential skills through reading, writing, speaking, production, and/or performance. Cadet skills in analysis, logic, and creativity will also be showcased through successful completion of this project.

The Honors Senior Project is primarily targeted for senior cadets in a three- or four-year program. However, it is not uncommon for other academically successful cadets enrolled in Advanced Placement, other Honors, or in an International Baccalaureate program to successfully complete this project.

In order to retain these cadets in the unit’s AFJROTC program and to continue to improve their critical thinking and research skills, selected cadets with demonstrated academic capabilities may also enroll in this class with SASI approval. Successful completion of the Honors Project will allow cadets to receive honors credit while maintaining their enrollment in the AFJROTC program. For cadets to receive honors credit, they must meet state/district/school honors course criteria.

Subject material for AS 510 MUST come from Holm Center/DEJ provided curriculum materials. All materials including the grading rubric for the Honors Senior Project is posted at:

**NOTE: Further guidance and restrictions for offering AS 510 can be found on page 12 of this guide.**

- WINGS | Menu | Published Files | Directory | JROTC | AFJROTC Curriculum | Honors Project.
STEM education is the intentional integration of science, technology, engineering, and mathematics, and their associated practices to create a student-centered learning environment in which students investigate and engineer solutions to problems, and construct evidence-based explanations of real-world phenomena with a focus on a student’s social, emotional, physical, and academic needs. To do this AFJROTC has developed educational partnerships with agencies provided the materials that will be used in STEM.

STEM education focuses on promoting creativity and exploration in the learning process. This means that educators shift from textbook teaching to more project-based learning. Overall, the benefits of including this type of education are rewarding and simple variations in instruction could change a stagnant classroom into a dynamic learning environment. Knowledge retention is just one major benefit. Critical thinking is another. During project-based learning, students are encouraged to find their own answers and draw their own conclusions.

Cadets are given the opportunity to design, build or program, as they are exposed to STEM concepts. They learn about these concepts in a real-world application and are required to apply them over and over again. These hands-on, mind-on activities help cadets understand how science, technology, engineering, and math are useful in their world and make connections to careers they may not have considered.

STEM education may be used by AFJROTC instructors to support aerospace science content areas AS 100; A Journey Into Aviation History, AS 200; The Science of Flight: Gateway to New Horizons, AS 220; Cultural Studies: An Introduction Into Global Awareness, AS 300; Exploring Space: The High Frontier, AS 500; Aviation Honors Ground School, and AS 510; Honors Senior Project. Additionally, integrating STEM coursework and projects can be used to support Career and Technical Education (CTE) Standards. These STEM courses will require an integrated learning approach where problem solving and engineering practices are included, where technology is seamlessly integrated throughout the lesson.

The following rules apply when using STEM curriculum materials:
1. STEM curriculum is “ONLY” intended to supplement, NOT replace Aerospace Science curriculum and WILL NOT be used in place of LE, Drill, or Wellness/PT curriculum.
2. Cadets WILL NOT be allowed to repeat STEM curriculum once taken.
3. STEM curriculum should receive a minimum of elective credit from school/district.
4. STEM curriculum may be offered in place of HQ’s provided AS curriculum that equates to one half term of a 4x4 or Block schedule and one quarter of a Trad/Tri/A-B schedule for any academic year.
5. STEM curriculum name and description must be added to the course syllabus.
6. STEM curriculum name and description must be added to the “Unit Defined Courses” when taught.
7. AFJROTC units must receive an approved “Holm Center/DEJ” curriculum waiver to teach content as STEM if not on the Holm Center/DEJ approved STEM curriculum list.
8. LE, Drill, or Wellness/PT WILL NOT be used as STEM curriculum.
10. Co-curricular activities not identified as STEM **WILL NOT** be used as a STEM course.
   - Examples of co-curricular activities include CERT, Marksmanship, Orienteering, Drill Teams, and First Responder programs.
11. **Instructors will be required to develop lesson plans/PPT’s if none are provided by host organization.**
12. **No CPS/TPC files are provided, instructors are responsible for this action if they desire to use CPS/TPC as part of the lesson presentation.**
13. Refer to WINGS | Published Files | Directory | WINGS User Guides & Videos | JROTC Guides & Videos | JROTC Courses with Electives/STEM

**Learning Outcomes for Aerospace Science STEM Courses**

1. Increased enrollment and interest for STEM-related courses in AFJROTC.
2. Increased self-confidence in tackling science classes and related projects.
3. Gains in 21st century skills, including communication, teamwork, and critical thinking.
4. Higher rate of graduates interested in pursuing STEM-related college majors and/or careers.

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<tr>
<th>Science, Technology, Engineering, &amp; Mathematics (STEM)</th>
<th><strong>Maximum Hours</strong></th>
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<tbody>
<tr>
<td><strong>Courses</strong></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td><em>Unmanned Aerial Vehicles (UAVS) / Quadcopters</em></td>
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<td><em>Model and Remote Control Aircraft</em></td>
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<td><em>Weather Station “Air Environment”</em></td>
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<td><em>Astronomy</em></td>
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<td><em>Introduction to Cybersecurity</em></td>
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<td><em>Cyber Literacy</em></td>
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<td><em>Introduction to Robotics</em></td>
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<td><em>Model Rocketry</em></td>
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<tr>
<td><em>Advanced Rocketry</em></td>
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</tbody>
</table>
AFJROTC instructors can receive free supplemental aerospace (STEM) resources from the Civil Air Patrol (CAP) by joining as an Aerospace Education Member. This unique CAP membership category is designed for educators or others involved in promoting aerospace education in classroom, museums, and other youth organizations. Resources include national standards-based aerospace education materials to promote STEM subjects and careers, eligibility to apply for grants, STEM kits, and Teacher Orientation Program (TOP) Flights in CAP aircraft. As stated earlier, AFJROTC instructor’s membership is free of charge.

To join and enjoy the benefits of aerospace education member of CAP just go to the following URL and follow the instructions provided: http://ae.capmembers.com/become_a_member/educators/

Once you complete the online application enter the following access code in the coupon box so that your membership is at no cost: AFJR

CAP STEM kits and activity books are identified as “CAP” provided materials in the each STEM description. Some STEM material utilized by AFJROTC instructors may cover multiple STEM areas. The CAP STEM curriculum and kits are provided to instructors as supplemental material to be used with Holm Center provided AS curriculum. Instructors choosing to include supplemental CAP STEM material to reinforce HQ’s provided curriculum WILL include this material in WINGS | Unit Management | Unit Defined Courses.

NOTE: Holm Center Academic Affairs Directorate and CAP is offering AS STEM courses to supplement, NOT replace Holm Center provided Aerospace Science curriculum.
Modern UAVs and Quadcopters are probably the most advanced equipment in the field of robotics, aeronautics, and electronics today. These aerial vehicles that come in wide variety of sizes, shapes, functions can be programmed to fly independently or be remotely controlled systems from the ground. They are usually used to carry out tasks which may be too risky for manned flight. UAVs/Quadcopters that were initially used by the military are now finding uses in the civilian market, such as search and rescue, weather analysis, ground mapping, and as a hobby.

The CAP provided Unmanned Aerial Vehicles (UAVs) activity booklet allows instructors to incorporate UAV history and activities with the (AS200) The Science of Flight: A Gateway to New Horizons curriculum. Each activity has the National Science and Technologies Standards provided.

Additional quadcopter lesson plans have been placed in WINGS | Published Files | Directory | JROTC | AFJROTC Curriculum | STEM Courses. These lesson plans are cadet developed and provide a solid foundation for any unit wishing to add the quadcopter as a supplement to their Science of Flight curriculum.

Academy of Model Aeronautics (AMA) offers a free youth membership opportunity for cadets 19 years old or younger. Cadets who are enrolled in the AMA youth membership program are eligible for scholarships and AMA model flying insurance coverage. Instructors should take advantage of this opportunity for your cadets flying quadcopters or RC aircraft.

AMA also offers the AMA Flight School where instructors and cadets have access to online learning opportunities such as: Introduction to small Unmanned Air Systems (sUAS). Although some of these courses are only accessible after membership, cadets are free and can access all available online courses after becoming a member. The URL for the AMA Flight School: http://www.amaflightschool.org/

Federal Aviation Administration (FAA) also provides guidance for small UAV operation and who is required to have the Part 107 certificate for UAV operation. Although the AFJROTC provided quadcopter are considered recreational, but must be registered with the FAA. Refer to registration guidance provided by AFJROTC Director, Col. Bobby Woods.

Instructors may also choose to provide instruction to fulfill the FAA Part 107, Remote Pilot in Command certificate. Follow the guidance provided on the FAA website: https://www.faa.gov/uas/faqs/#reg
Model building and experimentation with flying will lead to learning to fly remote-controlled aircraft via a Real Flight Simulator computer program, a hand-held controller, curriculum, and two DVDs: Wings Aircraft and Aero Lab - which are all included in this kit. Everything a young enthusiast will need to determine if a career in general aviation or either manned or unmanned aerial vehicles will be provided. This kit is designed to promote a beginning interest in aviation and/or remotely-piloted aircraft vocations (careers) and avocations (hobbies). This program complements the new CAP AEX Model Aircraft and Remote Controlled (MARC) module developed by a CAP volunteer and included in the kit.

The CAP provided AEX Model Aircraft and Remote Controlled (MARC) activity booklet allows instructors to incorporate MARC construction and flight activities with the (AS200) The Science of Flight: A Gateway to New Horizons and AS 500: Aviation Honors Ground School curriculum. Each of these activities will help reinforce aircraft principles of flight, propulsion, and design. Each activity has the National Science and Technologies Standards provided.

As with the UAV/Quadcopter STEM course, the Academy of Model Aeronautics (AMA) offers a free youth membership opportunity for cadets 19 years old or younger. Cadets who are enrolled in the AMA youth membership program are eligible for scholarships and AMA model flying insurance coverage. Instructors should take advantage of this opportunity for your cadets flying quadcopters or RC aircraft.

AMA also offers the AMA Flight School where instructors and cadets have access to online learning opportunities such as the Modelers Flight Training Course and other flight training programs provided various RC clubs. Although some of these courses are only accessible after membership, cadets are free and can access all available online courses after becoming a member. The URL for the AMA Flight School: http://www.amaflightschool.org/

AFJROTC instructors are highly encouraged to seek out local RC Aircraft clubs for mentorship and guidance if not familiar with RC Aircraft operations. Not only will instructors have access to experienced RC pilots and builders, seeking out local clubs will help build networking relationships.
With the CAP provided Acu-Rite Professional Weather Station, learners can measure rainfall, barometric pressure, wind speed and more. The station also includes programmable weather alarms. Users will need to download the FREE My Backyard Weather Software & App to utilize the Weather Station to its fullest potential. Self-calibrating forecasting provides your personal forecast of weather conditions for 12 to 24 hours by collecting data from the sensor at your facility. The Weather Station comes with Rainfall Collector Funnel/accessories, display unit, USB cable, power adapter, instruction manual and mounting hardware. CAP Dimensions Module 3-Air Environment will also accompany the Weather Station STEM Kit. Batteries for the Rainfall Collector Funnel and display unit are not included.

Although *Air Environment: Module 3* textbook provides curriculum material similar to *AS200: Science of Flight: A Gateway to New Horizons; Chapter 2: Working Through Flight Conditions, Conditions*, the actual benefit of Module 3 is the hands-on activities. Use the weather station in combination with Module 3 activities will provide supplemental STEM-related opportunities for cadets to learn how weather can impact aviation operations and their daily lives.

**CAP) Air Environment: Module 3:**

*Introduction Contents*

National Academic Standard Alignment

Chapter 1. The Atmosphere
Chapter 2. Air Circulation
Chapter 3. Weather Elements
Chapter 4. Moisture and Clouds
Chapter 5. Weather Systems and Severe Weather

**Weather Station Kit Includes:**

AcuRite Professional Weather Station
Funnel/Accessories, Display Unit
USB Cable, Instruction Manual
CAP Dimensions Module 3 Textbook
The CAP provided astronomy STEM kit comes with a Portable Celestron Telescope, CD with Planetarium Software, and *CAP Astronomy Activity Book*. The Celestron Telescope is portable and lightweight table-top telescope, making it easy to store, transport and setup. Telescope is very easy to observe with, the user simply navigates the night sky by moving the tube in the direction of their desired object.

Although the Astronomy STEM kit includes the *CAP Astronomy Activity Book*, instructors should also order or download the *Astronomy Module* textbook. To order textbook instructors must use CAP’s Material Orders service: [https://www.capnhq.gov/CAP.eServices.Web/Default.aspx](https://www.capnhq.gov/CAP.eServices.Web/Default.aspx). Download the electronic version by clicking “AE Downloads and Resources” in eServices once you have logged in.

The *Astronomy Module* is part of the CAP Aerospace Education Excellence (AEX) Program and provides additional astronomy hands-on related activities. The same astronomy activity book that accompanies this module is also sent with the astronomy STEM kit.

Although *Astronomy Module* textbook provides curriculum material and activities similar to *AS300: Exploring Space: The High Frontier, Chapters 1, 2, 3, and 4*, the actual benefit of the astronomy module and activity book is the hands on activities.

The Science Standards used in the module and activity booklet came from the Next Generation Science Standards (NGSS). These standards are based on the *Framework for K-12 Science Education* developed by the National Research Council. To find out more about the NGSS, go to: [http://www.nextgenscience.org/](http://www.nextgenscience.org/)
The CAP provided STEM kit includes *Microsoft Flight Simulator as a Training Aid* book and accompanying flight simulation CD, yoke and rudder pedals. Included with kit is the *Microsoft Flight Simulator X STEAM Edition*, a downloadable product code (no disc required). The flight simulator book has many activities to help learners use flight planning aeronautical charts and other lessons to extend the experiential portion of the flight simulator program. The hands-on approach is designed to spark an interest in flying, especially for AFJROTC cadets who are given opportunities for orientation flights and flight training in CAP. Due to the experience of AFJROTC instructors, a variety of aviation careers may be explored through this program.

**NOTE:** Computers are not included in this kit. Computers need to be equipped with gaming and graphic software to utilize this kit.

**Microsoft Flight Simulator:** This is a series of flight simulation programs. The programs include generated scenery and detailed visual effects, various weather systems, cities and airports, air traffic control functions, interactive cockpits, and a variety of aircraft. Use this to supplement *AS 200: The Science of Flight: A Gateway to New Horizons* and *AS 500: Aviation Honors Ground School.*
StellarXplorers is an engaging competition designed to excite young people about space and the many opportunities that are available in the space operations field. One of the goals of StellarXplorers is for students to learn some of the academic information about space operations. Therefore, teams have been given access to an online space textbook, *Understanding Space*. This textbook is used for the Introduction to Space course at the Air Force Academy. The *Understanding Space* textbook may be used to supplement *AS-300: Exploring Space: The High Frontier*, but **WILL NOT** replace it. AS-300 textbook does not include the higher level concepts and calculations. While *Understanding Space* is a college textbook, units should only be using the sections which are appropriate for high school students.

This course and competition information may be found on the [AFA / StellarXplorers website](http://www.stellarxplorers.org/index.htm)

**ACADEMICS**

Cadets will be given access to online textbooks and presentations that will teach them about basic space operations, i.e. why satellites remain in orbit, how to define a satellite’s orbit, what equipment is on-board a satellite and how it works, and other information. This instruction is equivalent to some college-level courses on space operations. Instructors have the option to incorporate this material into their AS-300 lesson plans or the students are free to conduct an independent study of the course materials.

To evaluate student performance on the academics, quizzes are conducted during the competition phase of StellarXplorers. Each round of the competition will include a 20-question open-book quiz on the space system information needed for the scenario exercise. These questions will be drawn directly from the academic material. Teams will have one-hour to complete the quiz. The quiz may be taken before, during or after the scenario exercise. The team can elect to answer the quiz as a group or can assign responsibility for the quiz to one or more members of the team. However, the score on the academic quiz will be the score for the entire team. Teams can score up to 20 points or approximately 20% of their score for the competition round.

- **Practice Round 1**: Chapters 1, 2, 3
- **Qualifying Round 1**: Chapters 4 and 5.1
- **Qualifying Round 2**: Chapter 13 and 15.1
- **Qualifying Round 3**: Chapter 14
SCENARIO EXERCISES

The scenario exercise will be the primary means of evaluating the team’s understanding of space operations. The scenario is a six-hour hands-on exercise where the students will be given a problem which can be solved by either placing a satellite into a specific orbit, designing a satellite with a specific capability or launching a satellite on a specific launch vehicle. During many of these exercises, cadets will use a computer-based simulation program called Systems Tool Kit (STK). STK is built by Analytical Graphics, Incorporated (AGI) and is free to download from AGI’s website (www.agi.com). It is a powerful tool that will allow cadets to develop satellite orbits and evaluate the orbit’s ability to meet the mission requirements. It can also be used to evaluate the performance of different pieces of equipment that are on the satellite. Cadets will also need to develop and use their own analytical skills to evaluate the ability of their satellite orbit, equipment and launch vehicle selections to meet the mission’s performance, schedule and cost requirements. Each team’s scenario solution will be evaluated and scored. The scenario exercise score will be approximately 80% of the team’s total score for the competition round.

SYSTEMS TOOL KIT (STK) CERTIFICATIONS

Analytical Graphics, inc. (AGI) provides commercial software for designing, developing and operating missions within the space and national defense communities. AGI’s Systems Tool Kit (STK) is a 2D and 3D modeling environment used by engineers, mission analysts, operators and decision-makers to model complex systems (such as aircraft, satellites, ground vehicles and their sensors).

STK allows engineers and scientists to perform complex analyses of ground, sea, air, and space assets. At the core of STK is a geometry engine for determining the time-dynamic position and attitude of objects ("assets"), and the spatial relationships among the objects under consideration including their relationships or accesses given a number of complex, simultaneous constraining conditions. STK is a commercial off the shelf software tool. Originally created to solve problems involving Earth-orbiting satellites, it is now used in the aerospace for many applications.

AGI currently offers cadets the opportunity to earn free Industry Certifications in Systems Tool Kit operations. Cadets will progress through three levels of training from basic to advanced levels of proficiency.

COMPETITION

Teams consist of an adult Team Director (usually an instructor) and two to six students. Team Mentors with space experience are encouraged to assist in-person or via the internet; the Program can facilitate finding mentors. A nominal $200 fee is required to be paid for entry, with waivers available to Title I schools upon request. Contact your RD for non-Title I schools for possible assistance with entry fees.

PRACTICE

To prepare for the competition phase of StellarXplorers, three Practice Rounds will be held. Each held. Each of these six-hour rounds will be similar to the Qualification Rounds and will focus on focus on one of the different space mission areas: Orbit Planning, Satellite Design or Launch Operations. An academic quiz will be conducted during at least one of the Practice Rounds to prepare the students for the Academic Quizzes during the Qualification Rounds.
Technology STEM: CyberPatriot

CyberPatriot is the National Youth Cyber Education Program created by the Air Force Association to inspire high school, middle school and elementary school students toward careers in cybersecurity or other science, technology, engineering, and mathematics (STEM) disciplines critical to our nation's future and to help students be safe online. In addition to the National Youth Cyber Defense Competition, the program also features AFA CyberCamps.

Training materials have been archived from past CyberPatriot competitions and may be accessed without entering CyberPatriot competition. Coaches, Mentors, and Team Assistants registered for the current CyberPatriot competition can access the most recent training materials by logging into and creating accounts. The course and competition information may be found on the AFA / CyberPatriot website:

http://www.uscyberpatriot.org/

Training materials from previous CyberPatriot competitions including instructor notes and PPT slides are also located at:

WINGS / Published Files / Directory / JROTC / AFJROTC Curriculum / STEM Courses

- **Unit 0: Cyber Ethics** - This module outlines the fundamentals of ethical behavior in the real world and online. Topics include:
  - Important definitions
  - Ethical behavior
  - Ethics and cybersecurity
  - Ethics applications

- **Unit 1: Introduction to CyberPatriot and Cybersecurity** – This module contains information about the CyberPatriot program and cybersecurity concepts in general. Topics include:
  - CP-VII basics
  - The importance of cybersecurity
  - Cyber careers

- **Unit 2: Online Safety** – This module outlines ways to stay safe on the Internet. Topics include:
  - Cyberbullying
  - Personally identifiable information
  - Social media tips
Unit 3: Computer Basics and Virtual Machines – This module provides information about computer hardware and the software used to play competition virtual machine images. Topics include:
- Computer hardware basics
- Networking basics
- An overview of virtualization
- How to start a virtual machine

Unit 4: Principles of Cybersecurity – This module describes cybersecurity concepts in more detail. Topics include:
- CIA Triad
- How to build strong passwords
- Social engineering
- Malware

Unit 5: Microsoft Windows Security – This module is the most important for understanding how to find and fix common vulnerabilities on Windows images. Topics include:
- An introduction to Windows operating systems
- Firewalls
- Security tools and policies

Unit 6: Windows File Protections and Monitoring – This module contains more advanced Windows security topics, including:
- File protections
- Encryption
- Backups
- Auditing
- System monitoring

Unit 7: Introduction to Linux and Ubuntu – This module is helpful for gaining an introduction to non-Windows systems that may be used during the competition. Topics include:
- An introduction to Unix
- Linux Flavors
- Introduction to command line

Unit 8: Ubuntu Security - This module includes tips for securing an Ubuntu operating system. Topics include:
- GUI security
- Updates
- Command line security
- Security tools and policies

Unit 9: Additional Training Topics and Tips - This module contains other tips for competing in the CyberPatriot competition. Topics include:
- Topics for further study
- Tips from CyberPatriot veterans
**Technology STEM: Introduction to Cybersecurity**

A product of CAP Aerospace Education Division (2012)

This material can be found on the CAP website under Educational Materials. Instructors have the option of ordering the textbook or they may download the course materials directly from the website: [http://ae.capmembers.com/curriculum/educational_products/](http://ae.capmembers.com/curriculum/educational_products/)

The purpose of this module is to introduce current threats in Cyberspace and to provide some immediate activities for improving collective awareness and defense. A summary of careers in computer and network security is provided.

**An Introduction to Cybersecurity**

**Summary of Recent Attacks and Motivation for CAP Action**

**Activity Group One: Codes, Ciphers and Encryption Awareness**

*Unit Profile: Room 40 and Bletchley Park Biography: Alan Turing*

**Concepts in Information Assurance and Cyber Warfare**

**Activity Group Two: Vulnerabilities and Basic Defense Skills**

*Unit Profile: USCYBERCOM Patriot Bio: Gen. Keith Alexander*

**A Tale of Two Operating Systems: DOS and Windows and *NIX**

**Activity Group Three: Basic Probing Skills**

*Unit Profile: 24th Air Force & 67th Network Warfare Wing Patriot Bio: Col. Kevin B. Wooton*

**Exploring Careers in Cybersecurity**

**Activity Group Four: Preparation for Cyber Patriot**

*Unit Profile: 688th Information Operations Wing Patriot Bio: Col. Robert J. Skinner*

**Conclusion and Next Steps (Checklist for Action)**

**Activity Group Five: End of Module Exam**

**Appendices**

A. Motivational Chronology of Cyber Warfare

B. Glossary of Terms, Threats and Countermeasures

C. Toolbox of Promotional Resources

D. Toolbox of Technical Resources

E. Solutions to Module Activities and Exam
The National Integrated Cyber Education Center Research Center (NICERC) works with its partners to design project-driven, application-based curricula that engages students across primary, secondary, and post-secondary grade levels. NICERC curricula showcases a systems-level understanding of real-world applications of science, technology, engineering, and mathematics. Courses provide a hands-on, context-based approach to math and science professional development while incorporating liberal arts components, which allows instructors to embed the curricula across multiple aerospace science courses, empowering students to become the next generation of engineers and cyber professionals.

NICERC is an education partner of the Department of Homeland Security and National Initiative for Cybersecurity Careers and Studies. Not only does NICERC offer cyber curricula, this organization offers Teacher Resources, Teacher Professional Development, Cyber Camps, and Competitions.

Instructors may obtain these materials at: http://nicerc.org/

Instructors can gain access to each of the following lessons using the following instructions:

- Click on the “Projection-Driven Curricula / Learn More.”
- After next screen appears click on the “Learn More” tab at the bottom of any course.
- On the selected lesson page, scroll down and click on “To Request Access to the Selected Curriculum.”
- Complete the “Request for Access” form, in the “Choose the curricula you would like access” block, click all the courses you want to have access to lesson plans.
- You will receive an email with an appropriate URL link and login instructions for the courses selected.

**Cyber Literacy** introduces students to cyber by blending robotics, programming, electricity, and elements of Liberal Arts. Students will learn about the opportunities, threats, responsibilities, and legal constraints associated with operating in cyberspace.

**Cyber Literacy II** takes students into a deeper exploration of cyber by blending real-world robotics with significant investigations into the liberal arts and humanities. The robotics component is approached as a series of increasing systems-engineering challenges while the 4th Amendment investigations help students understand the relevance of privacy vs. security in today’s digital society as well as some key components of proper search and seizure.

**Cyber Science** uses a robotics platform to teach important cyber concepts and fundamentals. Students are engaged in a systems-level approach to problem-solving using robotics and computer science in the context of the humanities and make meaningful connections between STEM and liberal arts while learning how to become better cyber-citizens.
Cyber Society enables teachers to create cyber awareness among high school students who will help develop a pipeline of a future cyber workforce. The lessons within each module are easily customizable by teachers and cover a wide variety of topics including Cyber Law, Law, Cyber Ethics, Cyber Terrorism, Cyber Communications, and Cyber Business.

Computer Science course provides a broad understanding of computer science concepts by exposing students to computer programming using an objects-first approach and integrating relevant projects that utilize unique hardware and software platforms in order to provide tangibility to seemingly intangible concepts.

**Engineering STEM: Introduction to Robotics**

Robotics play an important part in education. With a great emphasis being placed on STEM in the classroom, robotics play an important part in motivating and exciting cadets about these subjects. Robotics involve multiple types of design: physical design of structures (construction materials, motors, and gears), as well as computational design (writing a computer program to determine how something should move and respond). Robotics will engage cadets in the learning process.

The *Introduction to Robotics* is part of the CAP Aerospace Education Excellence (AEX) Program and provides a history of robotics and hands-on related activities. The purpose of this STEM course is to provide an introduction to robotics and encourage cadets to explore the technology that robotics provide. The robotics curriculum provides beginning activities that are low-cost and high-interest. These activities progress into challenges that will require more resources and ingenuity to perform.

*Introduction to Robotics* textbook provides curriculum material and activities that can be used to supplement *AS 100, AS 200, and AS 300*. *Introduction to Robotics* textbook is designed as an introduction to building and understanding robotics; 21 lessons that start with basic, easy activities and progress into increasingly more difficult lessons. The curriculum and activities in this STEM courses have been aligned with the National Science Standards and National Technology Standards.

Members may order a copy through CAP's Material Orders Service in eServices. Electronic version is available by clicking "AE Downloads and Resources" in eServices
Modern rocketry has allowed many people and machines to be launched into space. Astronauts orbited Earth and landed on the Moon. Robot spacecraft traveled to the planets. Space was suddenly opened up to exploration and commercial exploitation. Satellites enabled scientists to investigate our world, forecast the weather, and to communicate instantaneously around the globe. As the demand for more and larger payloads increased, a wide array of powerful and versatile rockets had to be built. Now, current and future astronauts, scientists, and engineers hope to land a man or woman on the planet Mars by the year 2030.

This two-part CAP provided model rocketry STEM course is offered to help stimulate cadets’ interests in the fields of rocketry, engineering, and math. The basic course has been developed for the novice so they can participate in and have fun building inexpensive rockets while learning the history of rocketry, scientific rules of how rockets fly, and model rocketry safety. The basic model rocketry curriculum and activity guide will be sent as part of the rocketry STEM kit.

The Model Rocketry STEM Kit will include:
- Estes Alpha III rockets and motors
- Launch pad and controller
- Instructional DVD
- CAP Model Rocketry book

CAP has also introduced an Advanced Rocketry program to accommodate those cadets who wish to conduct more challenging projects in model rocketry. A rocketry guide that begins where "Model Rocketry" ended; contains advanced rocketry information to help build and launch rockets. Members may order a copy through CAP's Material Orders Service in eServices.

Holm Center JRO is currently working to sign a Memorandum of Understanding (MOU) with the National Rocketry Association (NAR). Through the partnership, the two organizations will explore ways to provide opportunities for cadets and instructors to initiate or increase their participation in model rocketry by collaborating on joint activities such as Team America Rocketry Challenge (TARC), mentorship, safety, local rocket contests, science fairs, design challenges, space-related activities, sport launches and other activities of mutual interest.
Leadership Education is an integral part of each year’s instruction. There are separate course materials for the Leadership Education and Aerospace Science academics program, however in practice, the overlap is considerable. The development of writing and speaking skills are categorized as “leadership education topics,” yet when used to present subject matter related to what is being taught in the “aerospace science” area, the results are twofold. Additionally, many after-school activities provide the proving ground for newly learned leadership skills. Activities such as drill teams, model rocketry clubs, and the formal cadet corps’ operation all require students to accomplish considerable responsibilities.

Goals for Leadership Education Courses

Students will learn about:

1. The program heritage, organization, and traditions; individual self-control; personal behavior, wellness, personal and environmental health, and US citizenship and government.

2. Effective communication; increased awareness of self and others; values of personal integrity, service, and excellence; and improved leadership.

3. Financial literacy, college and career readiness; and how to prepare for life after high school in the high-tech, globally oriented, and diverse workplace of the 21st century.

4. Management basics, theories, and approaches; planning and decision making; organizing to manage change, stress, and innovation; and leading individuals and groups.

5. Drill and ceremonies execution and performance, and how drill helps the individual, builds the team, and develops leaders.

Leadership Education Courses

<table>
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<tr>
<th>Course Title</th>
<th>Maximum Hours</th>
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<tr>
<td>Leadership Education 100: Traditions, Wellness, and Foundations of Citizenship</td>
<td>40</td>
</tr>
<tr>
<td>Leadership Education 200: Communication, Awareness, and Leadership, 2nd Ed.</td>
<td>40</td>
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<tr>
<td>Leadership Education 300: Life Skills and Career Opportunities</td>
<td>40</td>
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<td>Leadership Education 400: Principles of Management</td>
<td>36</td>
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<tr>
<td>Drill Curriculum; Cumulative: Drill and Ceremonies</td>
<td>36</td>
</tr>
<tr>
<td>Leadership Education Electives</td>
<td>18</td>
</tr>
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Leadership Education 100:
Traditions, Wellness, and Foundations of Citizenship
Published by the Pearson Learning Solutions
LEADERSHIP EDUCATION 100:  
TRADITIONS, WELLNESS, AND FOUNDATIONS OF CITIZENSHIP

LE 100 is the component of JROTC leadership education. It is intended for students who are entering the AFJROTC program and beginning their high school studies. It will introduce cadets to history, organization, mission, traditions, goals, and objectives of JROTC for all services. It introduces key military customs and courtesies, how to project a positive attitude, and exam the principles of ethical and moral behavior. It provides strategies for effective note taking and study skills for academic success. Lessons will cover how to be emotionally, mentally, and physically healthy. Avoiding and preventing violence in today’s society will also be covered. How to recognize types of bullying and how to advocate for prevention of this type of behavior. It will cover healthy living, physical fitness, and how to make safe, drug-free, and responsible decisions. This textbook will also examine the negative effects of air and water pollution, and how to help keep the environment safe. Cadets will be introduced to civics and our national government, including a historical understanding of the American flag and other important national symbols. The final chapter will also cover how the US Constitution protects our rights and freedoms as American citizens.

Course Outcomes:

1. Analyze the heritage, organization, and tradition of service programs.
2. Analyze the benefits of positive personal behavior.
3. Evaluate healthy living through physical activity and good nutrition.
4. Apply safe, drug-free decisions.
5. Analyze the importance of citizenship in the United States.

<table>
<thead>
<tr>
<th>Course Chapters</th>
<th>Recommended Hours</th>
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<tbody>
<tr>
<td>Chapter 1 Introduction to JROTC Programs</td>
<td>8.0</td>
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<tr>
<td>Chapter 2 Personal Behavior</td>
<td>8.0</td>
</tr>
<tr>
<td>Chapter 3 Be Health Smart</td>
<td>8.0</td>
</tr>
<tr>
<td>Chapter 4 Making Safe, Drug-Free Decisions</td>
<td>8.0</td>
</tr>
<tr>
<td>Chapter 5 The Foundations of United States Citizenship</td>
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Chapter 1: Introduction to JROTC Programs

Lesson 1: Organization of the JROTC
Learning Outcome: Identify the purpose and structure of the JROTC Programs.

Learning Objectives:
1. Discuss the history of the nation’s Junior ROTC programs.
2. Explain the organization of Junior ROTC programs.
3. Examine the lines of responsibility and authority in Junior ROTC programs.

Lesson 2: The Military Uniform and Appearance Standards
Learning Outcome: Determine proper wear of the military uniform.

Learning Objectives:
1. Explain uniform wear and history.
2. Explain the purpose of uniform wear, restrictions, and standards.
3. Describe the uniforms used within special teams.
4. Describe cadet appearance and grooming standards.
5. Identify military rank and grade insignia.

Lesson 3: Customs and Courtesies for Junior ROTC
Learning Outcome: Apply customs and courtesies in the Junior ROTC environment.

Learning Objectives:
1. Describe the difference between a custom and a courtesy.
2. Identify historic customs and courtesies.
3. Explain the proper methods to demonstrate recognition and respect.
4. Describe the standard usage of military time.

Lesson 4: Attitude, Discipline and Respect
Learning Outcome: Demonstrate the roles of respect and integrity in Junior ROTC.

Learning Objectives:
1. Describe the importance of a positive attitude.
2. Describe the importance of discipline.
Lesson 5: Ethics, Values and Morals

Learning Outcome: Demonstrate Ethical Concepts

Learning Objectives:
1. Describe the four basic rules of ethics.
2. Identify the four types of values.
3. Identify the core values of the US military services.
4. Explain cultural and universal norms
5. Describe how to make ethical and moral decisions.
6. Identify your personal code of conduct.

Lesson 6: Social Etiquette and Dining In, Dining Out

Learning Outcome: Demonstrate proper etiquette in social settings.

Learning Objectives:
1. Analyze etiquette and manners in formal and informal settings.
2. Demonstrate proper dining etiquette.
3. Explain the handling of social invitations.
4. Demonstrate the proper application of public courtesies.
5. Describe historical background of Dining-Ins and Dining-Outs.

Chapter in Brief:

“Chapter 1: Introduction to JROTC Programs” explains the purpose and structure of the nation’s JROTC programs. In this chapter, cadets will discuss the history and current organization of each JROTC program, including the lines of responsibility and authority. Cadets will learn about the military uniform, including how to properly wear the uniform and meet the appearance and grooming standards expected of a cadet. Cadets will also learn to learn to recognize the different US military ranks and grades. They will learn about military customs and courtesies such as saluting, many based on historic practices, which distinguish the JROTC as an important part of our nation’s traditions. Through understanding JROTC as an environment that builds leadership and good citizenship through respect for others, cadets will learn how to project a positive attitude and self-discipline. Cadets will consider how to apply ethical and moral concepts, including those of the military services and various cultures. The chapter’s final lesson will help cadets build social skills through proper behavior, personal hygiene, and grooming. Finally they will learn how to plan and participate in military functions, especially Military Balls, Dining-Ins, and Dining-Outs.
Chapter 2: Personal Behavior

Lesson 1: Note Taking and Study Skills
Learning Outcome: Analyze effective methods of taking notes and studying for exams.
Learning Objectives:
1. Analyze effective note taking strategies.
2. Describe the eight types of Thinking Maps®.
3. Demonstrate effective study skills.
4. Recall effective strategies for taking exams.
5. Develop an effective homework plan.

Lesson 2: Managing Stress
Learning Outcome: Determine the main causes and effects of stress.
Learning Objectives:
1. Explain the difference between positive and negative stress.
2. Describe the effects of stress on the body.
3. Describe ways to manage stress.
4. Analyze methods to manage time.

Lesson 3: Making Positive Decisions
Learning Outcome: Outline steps required to achieve personal goals.
Learning Objectives:
1. Employ a goal setting process to arrive at healthful decisions.
2. Explain the impact of communication skills on leadership.
3. Apply responsible use of electronic media devices.

Lesson 4: Emotional and Mental Health Care
Learning Outcome: Examine when and how to seek professional mental health care.
Learning Objectives:
1. Identify and understand emotions.
2. Analyze mental and emotional problems and the effects on behavior.
3. Identify sources for getting help with mental and emotional problems.
Lesson 5: Avoiding and Preventing Violence
Learning Outcome: Evaluate methods on how to protect yourself and others from violence.

Learning Objectives:
1. Examine the problem of violence in our society.
2. Identify ways to prevent violence in schools.
3. Describe ways of protecting yourself from rape or sexual violence.

Chapter in Brief:
“Chapter 2: Personal Behavior” focuses on success in school, personal life, and community. Cadets will learn effective methods for taking notes and studying. They will also learn to manage stress in school and elsewhere by recognizing its main causes, positive versus negative stress, and stress’ effects on the body. Stress-handling strategies, including time management, management, can help cadets be more productive in all aspects of their life. The chapter then covers how to make positive decisions on behavior through goal setting and effective communications—important for success and leadership in today’s high-tech environment. Cadets will find out how to recognize emotional problems, and how to seek professional mental health care for themselves and others. They will learn about factors that contribute to teen to teen violence in our society, from bullying and cyberbullying to gangs and drug use. Finally, cadets will learn to identify ways to deal with violence in schools and elsewhere, including ways of preventing bullying, rape, and other sexual violence.
Chapter 3: Be Health Smart

Lesson 1: Your Body Systems
Learning Outcome: Identify key components that make up the human body

Learning Objectives:
1. Identify the different functions of the human skeletal system.
2. Explain how the muscular system works.
3. Describe different parts of the human circulatory system.
4. Describe how the human respiratory system works.
5. Identify how the nervous system and sense organs work.
6. Describe how the digestive system breaks down food.
7. Explain how the body’s waste disposal system works.

Lesson 2: Nutrition
Learning Outcome: Identify resources that can be used to make healthful dietary decisions.

Learning Objectives:
1. Identify what influences food choices.
2. Describe the six types of nutrients and explain how the body uses them.
3. Identify resources that can help you make wise food choices.

Lesson 3: The Benefits of Physical Activity
Learning Outcome: Evaluate the importance of physical fitness.

Learning Objectives:
1. Define the benefits of an active lifestyle.
2. Examine ways to increase your level of fitness through exercise.
3. Analyze strategies for improving aerobic capacity, muscular strength and endurance, and flexibility to improve overall health.
4. Devise a plan to set and achieve fitness goals.
5. Identify the three stages of an exercise session.
6. Analyze methods to monitor fitness progress.
7. Identify safety concerns when participating in sports.
8. Evaluate the effects of performance-enhancing drugs (PEDs).
Lesson 4: Understanding Your Body Image

Learning Outcome: Understand how body image, eating, and physical activity affect health.

Learning Objectives:
1. Define body image.
2. Explain the relationship between weight problems and diet.
3. Describe ways to manage an appropriate weight.
4. Explain the dangers of eating disorders.

Lesson 5: First Aid

Learning Outcome: Analyze what to do in a medical emergency.

Learning Objectives:
1. Define first aid.
2. Explain how to recognize and treat common emergencies.
3. Outline steps to take in severe emergencies.

Chapter in Brief:

“Chapter 3: Be Health Smart” first examines body systems by identifying the key components of the human body. Cadets will explore the functions of the skeletal, muscular, circulatory and respiratory systems, as well as those of the nervous, digestive, and waste systems. Applying this knowledge, cadets learn how to make healthful dietary decisions. They will then consider the importance of physical fitness and the benefits of an active lifestyle. Cadets will also consider how body image, eating, and physical activity affect health. To reduce risks of physical injury during exercise, cadets will identify safety concerns for participating in sports, and consider the risks of performance-enhancing drugs (PEDs).

This chapter also covers first aid for treating self or others in a medical emergency. They’ll learn how to recognize and treat common emergencies, from sprains, choking, and shock to heat-related illnesses. Finally, cadets will also learn how cardiopulmonary resuscitation (CPR) and the Automated External Defibrillator (AED) can save lives.
Chapter 4: Making Safe, Drug-Free Decisions

Lesson 1: Medicines and Drugs
Learning Outcome: Compare and contrast the difference between medicine and drugs.
Learning Objectives:
1. Explain how medicines differ from drugs.
2. Explain the difference between drug misuse and drug abuse.
3. Identify how people who abuse drugs can get help.
4. Describe ways to live drug free.

Lesson 2: Tobacco
Learning Outcome: Explain the dangers of tobacco.
Learning Objectives:
1. Explain the history of tobacco use.
2. Identify the harmful substances in tobacco.
3. Describe the costs of tobacco to society.
4. Explain how to avoid tobacco use.

Lesson 3: Alcohol
Learning Outcome: Describe the dangers of alcohol.
Learning Objectives:
1. Explain how alcohol is a threat to everyone.
2. Describe alcoholism.
3. Explain why some teens drink alcohol.

Lesson 4: Environmental Health
Learning Outcome: Analyze the connection between the environment and your health.
Learning Objectives:
1. Describe the effects pollution has on health.
2. Demonstrate methods for reducing and preventing pollution.
Chapter in Brief:
“Chapter 4: Making Safe, Drug-Free Decisions” focuses on staying mentally and physically fit by avoiding illegal drugs. Understanding how medicines differ from drugs will help cadets see how substances can be used for good or harm. They will compare drug misuse with drug abuse, and learn the effects and dangers of popular drugs. Cadets will study the history of tobacco, the harmful substances it contains, and its terrible costs to society. They will learn how to avoid tobacco use, and proven ways to quit the habit. Cadets will also study alcohol’s effects, and why it can harmful. They will consider why some teens drink alcohol, examining how what teens may say can be different from the truth about drinking. Finally, they’ll learn refusal techniques to overcome peer pressure to drink, and review the healthy alternatives to drinking alcohol. The chapter’s final lesson considers how the environment relates to everyone’s health. They will study different types of pollution, including air, water, land, and other forms. Cadets will examine aspects of the greenhouse effect, and learn about methods of preventing and reducing pollution, including laws and community actions, as well as things everyone can do individually to make the environment healthier.

Chapter 5: Foundations of United States Citizenship
Lesson 1: The American Flag and Other National Symbols
Learning Outcome: Explain the history and courtesies rendered to the flag of the United States and other symbols.
Learning Objectives:
1. Outline the history of the flag of the United States.
2. Identify the courtesies rendered to the flag of the United States.
3. List the courtesies rendered to the National Anthem, Pledge of Allegiance, and the American’s Creed.
4. Describe the Great Seal of the United States and the military services’ seals.

Lesson 2: Civics
Learning Outcome: Analyze the duties and responsibilities of citizenship.
Learning Objectives:
1. Define civics.
2. Explain the need for government.
3. Explain citizenship and the naturalization process.
Analyze duties and responsibilities of citizenship, including volunteerism.
Lesson 3: The Constitution of the United States
Learning Outcome: Describe the content of the United States Constitution.

Learning Objectives:
1. Identify the parts of the Constitution and what they mean.
2. Describe the process of amending the Constitution.
3. Explain how the Constitution is interpreted.

Lesson 4: Interpreting the Bill of Rights and Other Amendments
Learning Outcome: Interpret the content of the Bill of Rights and other amendments.

Learning Objectives:
1. Explain the protections of individual freedoms in the Bill of Rights.
2. Identify ways the Bill of Rights protects the rights of the accused.
3. Describe other rights protected by the Bill of Rights.
4. Explain how the Bill of Rights protects all Americans.

Lesson 5: US National Government
Learning Outcome: Summarize the duties and responsibilities of the three branches of government.

Learning Objectives:
1. Describe the legislative branch of government.
2. Explain the executive branch of government.
3. Describe the judicial branch of government.

Chapter in Brief:
“Chapter 5: Foundations of United States Citizenship” opens with a history of the American flag, American flag, and discusses the courtesies rendered to the flag, the National Anthem, the Pledge of Allegiance, and the American’s Creed. Cadets will learn about the Great Seal of the United States and the military services’ seals. They will consider the role of civics in society and the need for effective government. They will study the nature of citizenship and how the naturalization process grants this lifelong privilege to those who were not born citizens. The lesson will then cover the duties and responsibilities of citizenship. Cadets will then learn about the fundamental document of our government, the United States Constitution, Constitution, by studying its parts and what they mean. They will also cover the process of amending the Constitution and be able to explain how the Constitution is interpreted. Cadets will look at each amendment to identify ways the Bill of Rights and other amendments to the Constitution protect the rights of all Americans, in all possible situations. The final lesson of this chapter covers the three branches of the national government. By analyzing the functions of the legislative, executive, and judicial branches, cadets will understand the concept of checks and balances. By looking at the political system in operation in the House of Representatives and the Senate, they will be able to see how Congress works to meet the nation’s needs and interests.
Leadership Education 200: Communication, Awareness, and Leadership 2nd Ed.

Published by C² Technologies, Inc.
Leadership Education 200: Communication, Awareness, and Leadership 2nd Ed.

Leadership Education 200: Communication, Awareness, and Leadership, Second Edition, is a customized course designed to improve communication, enhance awareness of self and others, and provide fundamentals of leadership and followership. The course focuses on the Air Force Junior Reserve Officer Training Corps (AFJROTC) mission to “develop citizens of character dedicated to serving their nation and community.” Woven throughout is the underlying theme of developing personal integrity. The course also emphasizes leadership and values such as service and excellence. This update incorporates 21st century teaching, learning, and skills of critical thinking, communication, collaboration, and creativity.

Each lesson includes a “Quick Write” reading and writing activity related to the lesson; a “Learn About” that tells students what they will learn from the lesson; a list of vocabulary words in the lesson; “Talking Points” that highlight specific and interesting facts; and many stories, biographies, and profiles. The lessons close with a “Checkpoints Lesson Review” that will allow students to review what they have learned. At the end of the “Checkpoints” is an “Applying Your Learning” section with a discussion question that will give students a chance to use what they have learned and provides another way to reinforce their understanding of the lesson’s content. The text has eight chapters; each chapter contains three lessons.

Course Outcomes:

1. Analyze the key factors in communication and critical thinking.
2. Apply the elements of effective writing and public speaking.
3. Analyze the importance of attitude in daily life.
4. Evaluate the ways in which personality and behavior affect relationships with others.
5. Analyze the foundation for an effective team.
6. Apply effective problem-solving and consensus-building methods.
7. Analyze the Air Force leadership model.
8. Evaluate effective leadership and followership.

### Course Chapters

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Chapter 1: Learning and Communication

Lesson 1: Learning to Communicate
Learning Outcome: Analyze the elements of the communication process.

Learning Objectives:
1. Explain how the communication process works.
2. Give examples of barriers to effective communication.
3. Illustrate the importance of feedback.

Lesson 2: Learning to Listen
Learning Outcome: Demonstrate the ability to use good listening skills.

Learning Objectives:
1. Describe the listening process.
2. Summarize the four types of listening.
3. Explain the importance of listening.
4. Give examples of myths about listening.
5. Describe bad listening habits.
6. Demonstrate effective listening techniques.

Lesson 3: Learning to Think Critically
Learning Outcome: Demonstrate the ability to use good critical thinking skills.

Learning Objectives:
1. Explain the importance of learning to think.
2. Identify the standards of critical thinking.
3. Discuss how to ask good questions.
4. Describe how to design and evaluate your learning.

Chapter in Brief:

“Chapter 1: Learning and Communication” explains the basics of the communication process, how to improve your listening skills, and how to think critically. “
Chapter 2: Communicating Effectively

Lesson 1: The Basic Checklist for Writing
Learning Outcome: Analyze the process in the basic checklist for writing.

Learning Objectives:
1. Describe the steps in the basic checklist for writing.
2. Explain how to analyze your purpose and audience.
3. Explain how to conduct research to support your ideas.
4. Summarize ways to support your ideas.
5. Describe the benefits of getting organized.
6. Describe the elements of drafting and editing.
7. Explain the benefits of fighting for feedback.

Lesson 2: Writing Effectively
Learning Outcome: Analyze the elements of effective writing.

Learning Objectives:
1. Discuss what makes writing effective.
2. Explain what tone and clarity are.
3. Describe continuity and the three-part structure.
4. Summarize how to write effective sentences.
5. Apply safe and responsible practices for communicating online.

Lesson 3: Speaking Effectively
Learning Outcome: Deliver a presentation using the elements of effective speaking.

Learning Objectives:
1. Describe what effective speaking is.
2. Discuss the importance of preparation for effective speaking.
3. Explain how to organize your presentation.
4. Describe the effective use of visual support.
5. Explain how to use presentation skills
6. Practice and give your presentation.

Chapter in Brief:

“Chapter 2: Communicating Effectively” provides a basic checklist for constructing your communication, as well as ideas on how to write effectively and be a better public speaker.
Chapter 3: Understanding Your Attitude

Lesson 1: Interpreting Events and Experiences
Learning Outcome: Describe how interpreting events and experiences influences daily life and the future.

Learning Objectives:
1. Discuss interpreting events and experiences.
2. Explain the hierarchy of needs.
3. Describe the importance of a positive outlook on life.
4. Summarize how perspective molds your understanding of life
5. Summarize how perspective molds your purposes, passions, and practices.
6. Discuss how personality shapes your perspective and motivation.
7. Explain how actions reveal your attitudes.

Lesson 2: Developing a Positive Attitude
Learning Outcome: Analyze the benefits of developing a positive attitude.

Learning Objectives:
1. Explain the significance of a positive attitude.
2. Describe why people use defense mechanisms.
3. Discuss the importance of integrity and credibility.
4. Discuss the importance of humility and patience.
5. Discuss the importance of respect and appreciation.
6. Describe the importance of focusing on task completion and people.

Lesson 3: What It Takes to Be a Leader
Learning Outcome: Examine how important traits leaders share help them overcome challenges.

Learning Objectives:
1. Summarize what a good leader is.
2. Describe the actions associated with perseverance in a leader.
3. Describe the actions that identify courage in a leader.
4. Describe the actions associated with patience in a leader.

Chapter in Brief:
“Chapter 3: Understanding Your Attitude” describes how you and others interpret the events and experiences around you. It discusses how to develop a positive attitude and what it takes to be a leader, and includes several examples of leaders who overcame serious difficulties in their own lives.
Chapter 4: Understanding Your Actions

Lesson 1: Integrity and Character
Learning Outcome: Analyze how integrity and character affect behavior.

Learning Objectives:
1. Explain the importance of the traits of integrity.
2. Describe what it means to be a positive role model.
3. Discuss how character affects behavior.

Lesson 2: Personality and Actions
Learning Outcome: Examine how personality affects your relations with other people.

Learning Objectives:
1. Explain the theories of personality types and traits.
2. Describe how personality influences actions.
3. Discuss the value of different kinds of personalities.

Lesson 3: Consequences and Responsibilities
Learning Outcome: Evaluate how your ability to take responsibility determines your ability to lead.

Learning Objectives:
1. Describe the consequences of taking or avoiding responsibilities.
2. Explain how defense mechanisms affect your actions and decisions.
3. Discuss how you learn to take responsibility for your actions and decisions.

Chapter in Brief:
“Chapter 4: Understanding Your Actions” focuses on integrity and character, your personality and how it affects your actions, and consequences and responsibilities.
Chapter 5: Developing Vision and Teams

Lesson 1: Group and Team Dynamics
Learning Outcome: Evaluate how effective teams form and develop.

Learning Objectives:
1. Explain the importance of working as a team.
2. Describe the characteristics of effective teams.
3. Summarize the four stages of team development.
4. Discuss how to run an effective meeting.

Lesson 2: Building Mutual Respect
Learning Outcome: Analyze the importance of mutual respect in team building and performance.

Learning Objectives:
1. Discuss the different dimensions of respect.
2. Discuss the values of tolerance and understanding.
3. Explain ways of improving group effectiveness.

Lesson 3: Establishing a Common Vision
Learning Outcome: Examine how having a common vision helps a team achieve its goals.

Learning Objectives:
1. Describe the importance of a common vision.
2. Explain how to write a team charter
3. Summarize ways of enlisting others to work toward a common vision

Chapter in Brief:

“Chapter 5: Developing Vision and Teams” covers the essence of group and team dynamics, including how to build mutual respect and how to establish a common vision for a group or team.
Chapter 6: Solving Conflicts and Problems

Lesson 1: Identifying Conflict in Groups
Learning Outcome: Analyze the conflicts that arise in groups and the ways group members react to them.

Learning Objectives:
1. Summarize the three types of problems in groups.
2. Describe the three types of conflict in groups.
3. Explain four main ways of handling conflict.

Lesson 2: Steps for Problem Solving
Learning Outcome: Examine how to apply problem-solving steps to group problems.

Learning Objectives:
1. Describe the five common types of group problems.
2. Discuss common indicators of group problems.
3. Summarize the six steps of problem solving.

Lesson 3: Building Consensus
Learning Outcome: Analyze ways to build consensus in a group.

Learning Objectives:
1. Discuss the nature of consensus.
2. Summarize methods of building consensus.

Chapter in Brief:
“Chapter 6: Solving Conflicts and Problems” examines how to identify levels of conflict, a series of steps for problem solving, and how to build consensus among team members.
Chapter 7: A Leadership Model

Lesson 1: An Introduction to US Air Force Leadership
Learning Outcome: Analyze how applying the elements of Air Force leadership and core values results in more-effective leaders.

Learning Objectives:
1. Summarize the two basic elements of leadership.
2. Explain the three Air Force Core Values.
3. Discuss the four reasons for recognizing the Core Values.

Lesson 2: Leadership Characteristics
Learning Outcome: Analyze the characteristics that make an effective leader.

Learning Objectives:
1. Discuss the six characteristics of effective leaders.
2. Describe the actions associated with competence in a leader.
3. Describe the actions associated with commitment in a leader.

Lesson 3: Air Force Leadership Principles
Learning Outcome: Examine why the Air Force leadership principles result in effective leadership.

Learning Objectives:
1. Discuss the key principles of leadership.
2. Explain the importance of knowing yourself and your role.
3. Explain the importance of setting the example.
4. Explain the importance of caring for your people.
5. Discuss the need to effectively communicate, educate, equip, and motivate people.
6. Discuss the importance of accepting responsibility.
7. Summarize the need to develop teamwork.

Chapter in Brief:
“Chapter 7: A Leadership Model” presents an introduction to US Air Force leadership, including the basic elements of leadership, the Air Force leadership concept, and the Air Force Core Values. It also looks at the characteristics for effective leadership and the Air Force Leadership Principles.
Chapter 8: Adaptive Leadership

Lesson 1: Leadership Style and Mission Demands
Learning Outcome: Analyze how leaders adapt their leadership styles to meet mission demands.
Learning Objectives:
1. Discuss the two orientations of leadership behavior.
2. Explain the four leadership styles.
3. Summarize the primary factors of the leadership situation.

Lesson 2: Followership
Learning Outcome: Examine the relationship between effective followers and effective leaders.
Learning Objectives:
1. Explain the importance of good followership.
2. Discuss the readiness factors of followers.
3. Discuss how to build effective relationships with leaders.
4. Summarize actions to take to become an effective follower.

Lesson 3: Leadership Preparation
Learning Outcome: Analyze leadership preparation and practice.
Learning Objectives:
1. Discuss how to prepare for leadership.
2. Summarize key elements of effective coaching and mentoring.
3. Explain ways to practice leadership.
4. Summarize actions that demonstrate leadership maxims.

Chapter in Brief:
“Chapter 8: Adaptive Leadership” explores leadership styles and how to adapt them to the demands of the mission, the importance of good followership and its relationship to good leadership, and how to prepare yourself for the responsibilities of leadership.
Leadership Education 300:
Life Skills & Career Opportunities
Published by Pearson Learning Solutions
Leadership Education 300: Life Skills and Career Opportunities

*Life Skills and Career Opportunities,* Second Edition provides an essential component of leadership education for today’s high school students. This course is designed to prepare students for life after high school in the high-tech, globally oriented, and diverse workplace of the 21st century.

Students will learn how to become a more confident financial planner and to save, invest, and spend money wisely, as well as how to avoid the credit trap. They will learn about real-life issues such as understanding contracts, leases, warranties, legal notices, personal bills, practical and money-saving strategies for grocery shopping, apartment selection, and life with roommates. The Holland Interest Inventory and other self-assessments will help them to reveal their attitudes, aptitudes, and personal skills. This self-understanding will allow them to explore career paths and understand requirements that they will need to be successful at work and in life.

To help students increase their potential for success through education, they will learn how to select a school that is right for them; how to apply for admission to a vocational or technical school, community college, or college/university; and how to succeed in these learning environments. Information is provided on how to conduct the job search for students who wish to enter the workforce right after high school or after additional education and training. They will learn how to prepare a winning résumé, and how to develop effective interviewing skills. Students will become more skilled at using the Internet for career research and learn how to network safely using social media. The text also provides information on working for the federal government to include careers in the military, aerospace industry, and public service. Finally, students will consider the most important elements of life skills for all Americans: civic responsibilities, such as volunteering, registering to vote, jury duty, and draft registration.

**Course Outcomes:**

1. Analyze the elements of successful financial management skills.

2. Create a plan to safeguard personal resources.

3. Analyze the different ways of pursuing a career path.

4. Analyze the requirements for applying to a college or university.

5. Analyze positive and negative impact of college life in meeting career goals.

6. Evaluate the essential process for successfully pursuing desired career or job.

7. Evaluate the benefits of working for the Federal Government.

8. Create a plan for successful career development.
**Leadership Education 300: Life Skills and Career Opportunities**

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Chapter 1 – Charting your Financial Course

Lesson 1 – Creating a Budget
Learning Outcome: Create a personal budget and financial plan
Learning Objectives:
1. Describe the components of a personal financial plan
2. Identify steps for creating and developing a personal financial plan
3. Explain the elements of a budget

Lesson 2 – Savings and Bank Accounts
Learning Outcome: Analyze services when choosing a bank
Learning Objectives:
1. Describe the types of services provided by the bank
2. Compare and understand services when choosing a bank
3. Demonstrate how to conduct bank transactions
4. Analyze steps for safe electronic banking

Lesson 3 – Real-Life Issues in Buying and Selling
Learning Outcome: Evaluate the buying and selling issues that occur in real life
Learning Objectives:
1. Explain types of shopping issues daily life
2. Summarize renting or leasing an apartment
3. Generate a plan for buying or leasing a car

Chapter in Brief:
“Chapter 1: Charting Your Financial Course” explains important concepts in building financial stability and wealth. Students will learn how to make a plan for earning money, saving it, and spending it. A personal financial plan can be the difference between the ability to do the things each of them wants and the feeling that they’ll never reach their financial goals in life. This chapter will provide them with an overall picture of how to create a budget before the text moves on to examine the specifics of savings, bank accounts, and the real-life issues students will face when buying and selling.
Chapter 2 – Managing Your Resources

Lesson 1: Avoiding the Credit Trap
Learning Outcome: Construct a pan for building your credit history
Learning Objectives:
1. Describe what is credit and important credit terms
2. Explain the positive and negative aspects of using credit
3. Examine sources of credit
4. Calculate how credit works
5. Describe how to use credit responsibly
6. Differentiate between credit and credit card options
7. Examine how to avoid credit card fraud
8. Analyze the consequences of deficit spending

Lesson 2: Insurance for Protecting Your Resources
Learning Outcome: Evaluate the advantages of having property protected
Learning Objectives:
1. Recall what insurance is and why it is necessary
2. Analyze the major types of insurance available to you
3. Create a plan to protect your personal and financial information

Chapter in Brief
“Chapter 2: Managing Your Resources” describes the types of credit and discusses positive and negative aspects of using credit, along with monitoring credit to build a positive credit history. By evaluating the types of insurance options available to protect resources, students will learn the importance of insurance and tips for protecting their personal and financial information.
Chapter 3 – Career Opportunities

Lesson 1: Researching Careers
Learning Outcome: Create a career path strategy to assist in making career decisions
Learning Objectives:
  1. Recall the importance of selecting and charting a career path
  2. Compare having a career versus getting a job
  3. Analyze a process to plan for career options
  4. Evaluate factors to consider when planning a career path and career planning information sources

Lesson 2: Self-Discovery
Learning Outcome: Evaluate the types of career paths as related to Interests / Aptitude / Attitude
Learning Objectives:
  1. Utilize personal inventories to understand yourself and career direction
  2. Identify your aptitudes and interests
  3. Identify your preferred learning styles
  4. Analyze personal preferences associated with various work environments and fields of interest
  5. Evaluate career paths that link to your personal aptitudes

Lesson 3: Career Paths
Learning Outcome: Analyze the requirements needed to pursue the career that best fits personal skills and interests
Learning Objectives:
  1. Recall the advantages of a technically-oriented career path
  2. Explain the types of job classifications associated with technically-oriented career paths
  3. Analyze the earning potential of various technically-oriented career paths
  4. Analyze different ways of pursuing a technically-oriented career path
  5. Recall the advantages of pursuing post-secondary degrees
  6. Explain the types of careers associated with educational tracks
  7. Investigate the earning potential of various education-oriented career paths
  8. Analyze different ways of pursuing an education-oriented career path
Chapter in Brief:

“Chapter 3: Career Opportunities” examines career opportunities students may pursue. It is designed to provide them with an overview of the high-tech, globally oriented, and diverse 21st-century workplace. The chapter discusses the importance of charting a career path, comparing career options, and evaluating key factors when choosing a career path. They will explore who they are by examining their own interests, values, attitudes, and abilities. Student self-discovery will help them choose careers based on each of them as a unique individual, and help them consider which work environments are best suited for their personal preferences. Finally, they will analyze different career paths available to them immediately after high school graduation or post-secondary vocational training or college education. By linking technical and educational career paths in this chapter, the intent is to communicate that both choices are worthwhile options.

Chapter 4 – Aiming Towards a College Degree

Lesson 1: Financing for College
Learning Outcome: Create a personal plan for financing college
Learning Objectives:
1. Identify the financial costs of college
2. Describe sources for college funding
3. Create a plan to finance a college education

Lesson 2: Selecting a College
Learning Outcome: Evaluate the criteria for selecting a college based on your personal goals
Learning Objectives:
1. Describe the process for choosing a college
2. Summarize the criteria for selecting a college
3. Compare alternative programs for earning college credit
4. Evaluate the college application process
5. Identify colleges that will best meet your needs

Lesson 3: Navigating the Testing Maze
Learning Outcome: Create test-taking strategies to promote success on college placement exams
Learning Objectives:
1. Describe college entrance examinations
2. Compare college placement exams
3. Identify methods for conquering test anxiety
4. Evaluate strategies for test-taking
Lesson 4: Essays, Interviews, and Campus Visits

Learning Outcome: Create a college application essay

Learning Objectives:
1. Explore the personal side of the college application process
2. Examine how to write a college application essay
3. Describe how to have a successful interview
4. Summarize the importance of campus visits

Chapter in Brief:

“Chapter 4: Aiming Towards a College Degree” focuses on selecting and applying for college. Students will examine the financial costs of attending college, explore sources of funding, and learn about the criteria, or standards, all students should consider when choosing a college. This chapter also covers college entrance exams and college placement tests; how to write an application essay; how to prepare for an admissions interview; and what to look for during a campus visit.

Chapter 5 – Charting Your Course

Lesson 1: Adjusting to College Life

Learning Outcome: Evaluate the importance of personal accountability

Learning Objectives:
1. Discuss aspects of campus life
2. Summarize what is expected of you as a student
3. Organize recommendations on how to make healthy lifestyle choices
4. Evaluate the importance of personal accountability

Lesson 2: Choosing a Major

Learning Outcome: Analyze careers associated with possible majors

Learning Objectives:
1. Identify majors that match your personal interests
2. Understand basic areas of college study
3. Evaluate careers associated with possible majors
4. Create a six-step process for selecting a college major
Lesson 3: Planning Your Schedule

Learning Outcome: Create a plan for managing your college schedule

Learning Objectives:
1. Recall the importance of time management
2. Describe procrastination and identify methods to beat it
3. Evaluate methods to manage your college schedule

Chapter in Brief:

“Chapter 5: Charting Your Course” examines aspects of preparing to attend college and charting the student’s course of study. They will explore aspects of campus life, including resources, organizations, and policies. They will also cover ways to ensure success in the college environment, including how to make healthy choices. Students will take the information they learned about themselves from Chapter 3 and examine the decision process for choosing a college major. This chapter will also explain the importance of effective time management and explains how they can avoid procrastination.

Chapter 6 – Applying for Jobs

Lesson 1: The Job Search Process

Learning Outcome: Evaluate multiple sources for finding job openings

Learning Objectives:
1. Describe potential jobs that meet personal preferences
2. Organize ideas for selling your skills to an employer
3. Evaluate multiple sources for finding job openings

Lesson 2: Pursuing a Career

Learning Outcome: Create a personal resume and cover letter specific to a job opening

Learning Objectives:
1. Describe the purpose of a résumé
2. Classify the different types of résumés
3. Identify tips for writing a great résumé
4. Create a personal résumé
5. Create a cover letter specific to a job opening
6. Create a portfolio to be used during a job search
Lesson 3: Building Interviewing Skills

Learning Outcome: Evaluate how employers interview prospective employees

Learning Objectives:
1. Describe the interview process
2. Explain the do’s and don’ts of interviews
3. Identify different types of interviews
4. Outline basic interview questions
5. Evaluate how employers evaluate interviewees

Chapter in Brief:

“Chapter 6: Applying for Jobs” evaluates the process of successfully pursuing a desired career. By examining what employers are looking for, the students—the career seekers, will be employing the most effective tool needed to sell their skills. They will learn how to organize the job search. They will also consider different résumé types, and be able to prepare a persuasive cover letter and résumé. Students will learn about different types of interviews, how an interview is conducted, and effective tips for interview preparation.
Chapter 7 – Working for the Federal Government

Lesson 1: Military Careers
Learning Outcome: Analyze military service as a career
Learning Objectives:
1. Describe the branches of the US military
2. Analyze the reasons for choosing a military career
3. Analyze entering the military as an enlisted member
4. Compare the educational opportunities for enlisted military members by service
5. Describe serving the military as a warrant officer
6. Create a plan for entering the military as a member of the Officer Corps

Lesson 2: Careers in Aerospace
Learning Outcome: Differentiate between different careers in the aerospace industry
Learning Objectives:
1. Recall careers in aerospace
2. Describe major organizations in the aerospace sector
3. Compare educational requirements for aerospace careers
4. Analyze career options in the aerospace industry

Lesson 3: Careers in Public Service
Learning Outcome: Evaluate careers in public service
Learning Objectives:
1. Identify types of public service careers
2. Evaluate careers available in the public service sector
3. Analyze options for criminal justice careers
4. Analyze careers in fire science and technology
5. Recall careers in homeland security

Chapter in Brief:
“Chapter 7: Working for the Federal Government” evaluates the benefits of working for the federal government. This chapter provides the requirements needed to enlist in the military or to enter as a member of the officer corps. The text also compares educational opportunities for enlisted members from each military service, making military service a career option, and describes how military training is useful when seeking a civilian career. Educational requirements are examined for careers in aerospace and explore specific career examples in aerospace. Finally, this chapter will provide information for selection and training in careers in criminal justice, fire science, and homeland security.
Chapter 8 – Developing Your Career Skills

Lesson 1: Planning Your Professional Development
Learning Outcome: Analyze personal values that contribute to professional success
Learning Objectives:
1. Summarize the process of planning for professional development
2. Create a career portfolio
3. Identify organizational and personal values that contribute to success

Lesson 2: Learning to Work With Others
Learning Outcome: Evaluate barriers to effective collaboration and teamwork
Learning Objectives:
1. Understand the communication process
2. Recall verbal and non-verbal communication
3. Describe barriers to effective communication
4. Evaluate communications within organizations
5. Demonstrate collaboration and teamwork

Lesson 3: Seeking Feedback and Promotions
Learning Outcome: Generate a career-path strategy
Learning Objectives:
1. Analyze feedback in the workplace
2. Describe strategies for earning a promotion
3. Develop a career-path strategy

Lesson 4: Your Civic Responsibilities
Learning Outcome: Evaluate the positive aspects of civic responsibility
Learning Objectives:
1. Recall the importance of civic responsibility
2. Explain the process to register to vote
3. Summarize the selection process for jury duty
4. Recommend ways to become involved in the community
Chapter in Brief

“Chapter 8: Developing Your Career Skills” will help students create a plan for successful career development. Students will summarize the process of successfully planning for professional development in the workplace. They will learn to create a professional portfolio, organize personal and organizational values, and maintain effective verbal and nonverbal communication. They will also learn how to seek and receive constructive feedback and identify successful tips for earning a promotion. Finally, the text will cover civic responsibilities. It will review the Selective Draft system, why it is important to vote, work as a volunteer, and be a productive member in the community.
Leadership Education 400: Fundamentals of Management
Published by C² Technologies, Inc.
Course Outcomes:

1. Analyze management and its application to JROTC.
2. Analyze the elements of project management.
3. Evaluate the importance of formal planning within an organization.
4. Analyze decision making within an organization.
5. Evaluate time management and change management within an organization.
6. Analyze concerns managers must consider in managing individuals and groups.
7. Analyze the factors that make work teams productive.
8. Evaluate the interpersonal skills of delegating, negotiating, and mentoring.

Leadership Education 400: Fundamentals of Management

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Chapter 1 – Introduction to Management

Lesson 1: What is Management
Learning Outcome: Analyze what management is
Learning Objectives:
   1. Summarize the definition of management.
   2. Explain how “managing” is different from “doing.”
   3. Discuss what management means for a JROTC cadet.

Lesson 2: Managing the Cadet Corps – An Overview
Learning Outcome: Describe the responsibilities of managing the Cadet Corps
Learning Objectives:
   1. Discuss managing activities.
   2. Summarize managing systems and technology.
   3. Explain managing yourself as you help manage your unit.

Lesson 3: Management and Leadership
Learning Outcome: Examine how management and leadership are both alike and different
Learning Objectives:
   1. Analyze feedback in the workplace
   2. Describe strategies for earning a promotion
   3. Develop a career-path strategy

Chapter in Brief

An Introduction to Management provides an introduction to management and its application to JROTC. It defines what management is and what managers do. It provides an overview for managing a JROTC unit—including its various activities, systems and technology, and learning to manage yourself as you help manage the unit. Finally, the chapter explains the similarities and differences between a leader and a manager and how a manager should think about the health and growth of the organization.
Chapter 2 – Project Management

Lesson 1: What is Management
Learning Outcome: Analyze what is involved in initiating and planning a project
Learning Objectives:

1. Describe what a project is.
2. Explain when something needs to be treated as a project.
3. Identify what is involved in initiating a project.
4. Discuss what is involved in planning a project.
5. Discuss how to determine the resources needed for a project.

Lesson 2: Organizing and Executing a Project
Learning Outcome: Describe the responsibilities of managing the Cadet Corps
Learning Objectives:

1. Describe what is involved in organizing a project.
2. Describe what is involved in executing a project.
3. Explain why it is important to control a project.

Lesson 3: Closing Out a Project
Learning Outcome: Analyze the importance of closing a project
Learning Objectives:

1. Discuss why closeout is an important part of a project.
2. Describe what closing out a project includes.
3. Explain why it is important to capture the lessons learned for the future.

Chapter in Brief

Project Management discusses in detail the elements of managing a project from start to finish. It defines what a project is and looks at what is involved in initiating and planning a project. The chapter then moves on to examine how to organize and execute a project and how the manager maintains control. It concludes with a review of the importance of properly closing out a project and capturing the lessons learned for the future.


Chapter 3 – Planning: Laying the Foundation

Lesson 1: Starting With a Vision of Success
Learning Outcome: Examine the kind of planning that managers need to do
Learning Objectives:
1. Summarize the arguments for and against planning.
2. Explain the types of plans organizations use.
3. Discuss the types of goals an organization sets.

Lesson 2: Knowing How Much Planning is Enough
Learning Outcome: Analyze how to know how much planning is enough
Learning Objectives:
1. Discuss balancing planning and doing.
2. Explain uncertainty factors in planning.
3. Explain the kinds of events an organization must prepare for.

Lesson 3: Using Meetings to Plan With Others
Learning Outcome: Evaluate how to think together with others in meetings to make plans and set goals
Learning Objectives:
1. Explain how to think together as a group.
2. Describe the importance of real dialogue within a group.

Chapter in Brief
Planning: Laying the Foundation looks at the reasons to plan, the types of plans organizations use, and the types of goals organizations set. A discussion of how to prevent over planning follows, along with a review of the uncertainty factors in planning and the kinds of events an organization must prepare for. The chapter wraps up by examining how to use meetings to plan with others, including strategies for thinking together as a group and fostering group dialogue.
Chapter 4 – Decision Making: Choosing Wisely

Lesson 1: Improving Your Decision Making
Learning Outcome: Examine different approaches to making decisions
Learning Objectives:
1. Analyze the six steps of the decision making process.
2. Discuss the difference between rational and intuitive decision making.
3. Explain making decisions through bounded rationality.

Lesson 2: Decisions That Are Important, But Not Urgent
Learning Outcome: Evaluate issues needing a decision based on their urgency or importance
Learning Objectives:
1. Describe the Eisenhower Principle.
2. Explain the difference between importance and urgency in making decisions.
3. Discuss making decisions in groups.

Chapter in Brief
Decision Making: “Choosing Wisely” reviews the steps of the decision-making process, the differences between rational and intuitive decision-making styles, and the benefits and pitfalls of decision-making shortcuts. The chapter then discusses the difference between importance and urgency in making decisions and examines the advantages and disadvantages of group decision making.
Chapter 5 – Organizing: Managing Time and Change

Lesson 1: Time Management
Learning Outcome: Analyze various elements necessary for effective time management
Learning Objectives:
1. Explain the importance of managing your time.
2. Discuss how to be effective, not just busy.
3. Describe the different time-management tools.
4. Describe weekly and daily schedules.

Lesson 2: Change Management
Learning Outcome: Analyze the management of change in an organization
Learning Objectives:
1. Explain what causes change in organizations.
2. Describe two metaphors for the change process.
3. Discuss handling resistance to change.

Chapter in Brief

Organizing: Managing Time and Change considers the importance of managing your time, being effective and not just busy, time-management tools, and daily and weekly schedules. It then discusses the causes of change in an organization and how a manager deals with change, two ways of looking at the change process, and how to handle resistance to change.
Chapter 6 – Leading: Managing Individual and Group Behavior

Lesson 1: Motivating Others
Learning Outcome: Analyze issues in motivating others
Learning Objectives:
1. Discuss theories of motivation.
2. Summarize managing a diverse cadet unit.
3. Explain how learning affects motivation.

Lesson 2: Evaluating Others
Learning Outcome: Describe the challenges in evaluating others’ performance
Learning Objectives:
1. Explain how your perceptions influence your management of others.
2. Discuss evaluating subordinates.
3. Describe the basics of giving an evaluation.

Lesson 3: Managing Difficult Situations
Learning Outcome: Examine how managers deal with difficult situations
Learning Objectives:
1. Discuss managing conflict.
2. Explain different people and difficult people.
3. Summarize ways to deal with difficult people.

Chapter in Brief

Leading: Managing Individual and Group Behavior deals with theories of motivation, the challenges of managing a diverse cadet unit, and how learning styles affect motivation. A discussion of the evaluation process follows, including how your perceptions influence your judgment of others, how to constructively evaluate subordinates, and the process of delivering a written evaluation. The chapter concludes with a look at managing conflict—including the contrast between people who are difficult versus those who are merely different—and suggests useful ways to deal with difficult people.
Chapter 7 – Understanding Work Teams

Lesson 1: Work Teams
Learning Outcome: Analyze how to structure and build effective work teams
Learning Objectives:
1. Explain how work groups develop and behave.
2. Discuss the types and characteristics of effective work teams.
3. Summarize how to build effective work teams.

Lesson 2: Managing Work Teams
Learning Outcome: Analyze how effective work teams function
Learning Objectives:
1. Explain how people become effective team members.
2. Describe the elements of an effective team meeting.
3. Discuss what is involved in handling team challenges.

Lesson 3: Communicating Within Work Teams
Learning Outcome: Examine communication problems and solutions for work teams
Learning Objectives:
1. Discuss various ways of sharing information with team members.
2. Explain how to ensure effective communication.
3. Describe choosing the best method for the situation.

Chapter in Brief
Understanding Work Teams discusses how work groups develop, the differences between work groups and work teams, the types and characteristics of effective work teams, and how to build an effective work team. It then examines how people become effective team members, the elements of an effective team meeting, and how to handle team challenges. A discussion of communicating within the team follows, including sharing information in the most appropriate way, ensuring communication is effective, and choosing the best communication method for the situation.
**Chapter 8 – Interpersonal Skills**

**Lesson 1: Delegating Successfully**
Learning Outcome: Examine the art of delegating responsibility to subordinates
Learning Objectives:
1. Explain what it means to delegate.
2. Summarize the steps to delegating efficiently.
3. Discuss challenges in delegating.

**Lesson 2: Negotiating Successfully**
Learning Outcome: Analyze the elements of successful negotiation
Learning Objectives:
1. Discuss managers and negotiation.
2. Explain the two types of negotiation.
3. Summarize how to negotiate.

**Lesson 3: Mentoring**
Learning Outcome: Analyze the mentoring process from the standpoint of both mentor and protégé
Learning Objectives:
1. Discuss the manager as mentor and coach.
2. Summarize mentoring and coaching techniques.
3. Describe the role of the mentee.

**Chapter in Brief**

Interpersonal Skills focuses on delegating, negotiating, and mentoring. The chapter reviews what it means to delegate, the steps to delegating effectively, and challenges to delegating. It moves on to a discussion of what managers must negotiate, the two types of negotiation, and how to negotiate. It concludes with an examination of the manager's role as mentor and coach, mentoring and coaching techniques, and the role of the mentee—person being mentored.
Drill and Ceremonies: Drill Curriculum (Cumulative)

The Drill and Ceremonies manual is used to teach the Drill Curriculum (Cumulative) course by providing an in-depth introduction to drill and ceremonies. The course concentrates on the elements of military drill, and describes individual and group precision movements, procedures for saluting, drill, ceremonies, reviews, parades, and development of the command voice. Cadets are provided detailed instruction on ceremonial performances and protocol for civilian and military events and have the opportunity to personally learn drill. Though each class will follow an established lesson plan, most of the work is to be hands-on. Instructors are provided AFM 36-2203 to teach the Drill and Ceremonies course and may download the latest version of AFM 36-2203 from Air Force e-pubs. In addition, instructors may order the Army Field Manual 3-21.5 and the Interservice Cross-Index Drill Manual to supplement the teaching of Drill and Ceremonies. There is also a Drill and Ceremonies Instructional DVD available to aid you in teaching drill.

The course objectives are:

After successfully completing AFM 36-2203: Personnel Drill and Ceremonies, the student will:

1. Know the importance of drill and ceremonies.
2. Know basic commands and characteristics of the command voice.
3. Apply and execute the concepts and principles of basic drill positions and movements.
4. Know when and how to salute.
5. Apply the principles and procedures of drill movements used with smaller units to the movement of a squadron.
6. Know the function of the group and the wing.
7. Know how groups and wings are formed.
8. Know the purpose and definition of ceremonies and parades.

“NOTE TO INSTRUCTORS”

Chapter 1: Introduction to Drill and Ceremonies

1. Chapter Objective

   Know the importance of drill and ceremonies.

2. Samples of Behavior/Main Points

   a. State the importance of drill and ceremonies.
   b. List the symbols that represent the leaders of the flight and squadron.
   c. List all the basic military drill terms.

Chapter 2: Commands and the Command Voice

1. Chapter Objective

   Know basic commands and characteristics of the command voice.

2. Samples of Behavior/Main Points

   a. Identify the types of commands used during the basic military drill movements.
   b. Identify the necessary qualities of the command voice.
   c. Define cadence.

Chapter 3: Individual Instruction

1. Chapter Objective

   Perform basic drill positions and movements.

2. Sample of Behavior/Main Point

   a. Execute various movements and positions of basic drill when given the command to do so.

Chapter 4: Drill of the Flight

1. Chapter Objective

   Perform parade movements as a flight.

2. Samples of Behavior/Main Points

   a. Execute the various marching movements.
   b. Execute proper military position and place prior to parade.
   c. Respond with proper military procedures for entire parade sequence.
Chapter 5: Drill of the Squadron

1. Chapter Objective
   Perform drill movements as a squadron.

2. Samples of Behavior/Main Points
   a. Execute basic drill commands as a squadron.
   b. Execute guidon bearer position.

Chapter 6: Group and Wing Formations

1. Chapter Objective
   Demonstrate a group and wing formation.

2. Sample of Behavior/Main Point
   a. Perform group and wing formations when given the command to do so.

Chapter 7: Ceremonies

1. Chapter Objective
   Know the purpose and definition of ceremonies and parades.

2. Samples of Behavior/Main Points
   a. Define ceremony and parade.
   b. State the purpose of ceremonies and parades.
   c. Identify the different types of ceremonies and parades.
   d. Define reveille and retreat.
   e. State when it is appropriate to raise and lower the flag.
Wellness is an official and integral part of the Air Force Junior ROTC program. It consists of two exercise programs focused upon individual base line improvements with the goal of achieving a national standard as calculated by age and gender. Wellness curriculum is instrumental in developing citizens of character dedicated to serving our nation and communities. The program is provided as a tool to help you develop individualized fitness programs for your cadets. Cadets will be given the opportunity to put into practice the wellness concepts that are taught in Leadership Education 100. Instructors are encouraged to include team sports in order to keep the Wellness Program fun and motivating. Team sports also provide cadets the opportunity to develop leadership skills and build esprit de corps. Instructors are also encouraged to utilize sites such as www.pecentral.org to help develop lesson plans and fitness activities. The Wellness Program also provides a list of 19 exercises with examples that may be utilized in a 36-week program modifiable to help provide variety and meet individual and district/state goals. Instructors should utilize fitness programs that best fit the requirements within their district/county/state. HQ AFJROTC offers suggested fitness programs that will instructors with developing a comprehensive fitness program. Cadet fitness improvement is rewarded by earning the Health and Wellness Ribbon.

The course objective for the Wellness Program is to:

Motivate AFJROTC cadets to adopt active, healthy lifestyles beyond program requirements and into their adult lives.

The goals of the Wellness Program are to:

1. Create an individualized fitness program based on national standards by age and gender.
2. Identify areas of improvements for each cadet and provide guidance for improvement.
3. Incorporate a physical fitness and wellness education program to reach fitness goals.

The following is a brief description of the fitness programs for AFJROTC units, each has its own merit and each may be utilized or personalized with unit developed lesson plans to help build a foundation from which to implement a program that promotes lifelong fitness programs.

Additional templates, guides, sample lesson plans, exercise descriptions, and a sample course syllabus can be found at:

WINGS | Menu | Published Files | Directory | JROTC | Wellness Program
Air Force JROTC Fitness Challenge

Regular physical activity in adolescents promotes health and fitness. Compared to those who are inactive, physically active youth have higher levels of cardio respiratory fitness and stronger muscles. Their bones are stronger, and they may have reduced symptoms of anxiety and depression. Youth who are regularly active also have a better chance of a healthy adulthood. They also typically have a lower Body Mass Index (BMI). With higher BMI’s, an increased risk for certain diseases such as heart disease, high blood pressure, type 2 diabetes, gallstones, breathing problems, and certain cancers may develop. Adolescents don't usually develop chronic diseases; however, risk factors for these diseases can begin to develop early in life. Regular physical activity makes it less likely risk factors will develop and more likely that adolescents will remain healthy as adults.

Key Guidelines for Adolescents:

Regular physical activity in adolescents promotes health and fitness. Compared to those who are inactive, physically active youth have:

- Higher levels of cardiorespiratory fitness and stronger muscles
- Lower body fatness
- Stronger bones
- Reduced symptoms of anxiety and depression

For more information about the Physical Activity Guidelines and associated toolkit, visit the President’s Challenge web site:
https://www.hhs.gov/fitness/resource-center/physical-activity-resources/index.html

Cadet Fitness Assessments

Instructors are expected to complete a pre- and post- Physical Fitness Assessment for cadets in their unit. A pre-assessment will establish a baseline for each cadet, the post assessment will determine whether the cadet has improved. The pre- and post- assessment will consist of the following five physical fitness exercises. Cadet fitness assessments are recorded in WINGS | JROTC Cadet Data | PFT Assessments (Individual).

- Curl-ups (or partial curl-ups)
- Shuttle run
- Endurance run/walk
- Pull-ups / Right Angle Push-ups / Flexed-Arm Hang)
- V-sit reach (or sit and reach)
PFT Assessment Descriptions

- Ensure cadet’s Parental Consent Forms has been completed prior to testing
- Cadets must do at least 1 exercise in the following 5 categories for a total of 5 exercises
- For additional guidance on conducting PFT assessment contact your Regional Director

Category 1: Curl-ups

Objective - To measure abdominal strength/endurance by maximum number of curl-ups performed in 1 minute.

Testing - Have cadet lie on cushioned, clean surface with knees flexed and feet about 12 inches from buttocks. Partner holds feet. Arms are crossed with hands placed on opposite shoulders and elbows held close to chest. Keeping this arm position, cadet raises the trunk, curling up to touch the outside of forearms and elbows to thighs and then lowers the back to the floor so that the scapula’s (shoulder blades) touch the floor, for one curl-up. If a cadet must rest, they must rest in the up position. To start, a timer calls out the signal “Ready? Go!” and begins timing cadet for 1-minute. The cadet stops on the word “stop.”

Scoring - “Bouncing” off the floor is not permitted. The curl-up should be counted only if performed correctly.

Category 1a: Partial Curl-ups

Objective - To measure abdominal strength/endurance by maximum number of curl-ups performed in 1 minute.

Testing - Have cadet lie on cushioned, clean surface with knees flexed and feet about 12 inches from buttocks. The feet are not held or anchored. Arms are extended forward with fingers resting on the legs and pointing toward the knees. The student being tested curls up, slowly sliding the fingers up the legs until the fingertips touch the knees, then back down until the head touches the partner’s hands. To start, a timer calls out the signal “Ready? Go!” and begins timing cadet for 1-minute. The cadet stops on the word “stop.”

Scoring - Record only those curl-ups done with proper form.

Category 2: Shuttle Run

Objective - To measure speed and agility.

Testing - Mark two parallel lines 30 feet apart and place two blocks of wood (2”x2”x4”) or similar objects (tennis balls) behind one of the lines. Cadets start behind opposite line. On the signal “Ready? Go!” the cadet runs to the blocks, picks one up, runs back to the starting line, places the block behind the line, runs back and picks up the second block and runs back across the starting line.

Scoring - Blocks (tennis balls) should not be thrown across the lines. Scores are recorded to the nearest tenth of a second.
Category 3: 1-Mile Run/Walk

Objective - To measure heart/lung endurance by fastest time to cover a 1-mile distance. Due to the extreme heat in some regions it may be necessary to do this exercise in-doors or early morning hours.

Testing - On a safe, one-mile distance, cadets begin running on the count “Ready? Go!” Walking may be interspersed with running. However, the cadets should be encouraged to cover the distance in as short a time as possible.

Scoring - Before administering this test, cadets’ health status should be reviewed. Also, cadets should be given ample instruction on how to pace themselves and should be allowed to practice running this distance against time. Sufficient time should be allowed for warming up and cooling down before and after the test. Times are recorded in minutes and seconds.

Category 4: Pull-ups

Objective - To measure upper body strength/endurance by maximum number of pull-ups completed in 1 minute.

Testing - Cadet hangs from a horizontal bar with arms fully extended and feet free from floor, using either an overhand grasp (palms facing away from body) or underhand grip (palms facing toward body). Small cadets may be lifted to starting position. Cadet raises body until chin clears the bar and then lowers body to full-hang starting position. Student performs as many correct pull-ups as possible. To start, a timer calls out the signal “Ready? Go!” and begins timing cadet for 1-minute. The cadet stops on the word “stop.”

Scoring - Pull-ups should be done in a smooth rather than jerky motion. Kicking or bending the legs is not permitted and the body must not swing during the movement.

Category 4a: Right Angle Push-ups

Objective - To measure upper body strength/endurance by maximum number of push-ups completed in 1 minute.

Testing - The cadet starts in push-up position with hands under shoulders, arms straight, fingers pointed forward, and legs straight, parallel, and slightly apart (approximately 2–4 inches) with the toes supporting the feet. Keeping the back and knees straight, the cadet then lowers the body until there is a 90-degree angle formed at the elbows with upper arms parallel to the floor. A partner holds her/his hands at the point of the 90-degree angle so that the cadet being tested goes down only until her/his shoulders touch the partner’s hand, then back up. If a cadet must rest, they must rest in the up position. To start, a timer calls out the signal “Ready? Go!” and begins timing cadet for 1-minute. The cadet stops on the word “stop.”

Scoring - Record only those push-ups done with proper form and in rhythm. Rationale Right angle push-ups provide a good indicator of the range of strength/endurance found in young people, whereas some are unable to do any pull-ups. Pull-ups remain an option for those cadets at higher levels of strength/endurance.
Category 4b: Flexed-Arm Hang

Cadets who cannot do one pull-up or want an alternative to the pull-ups or right-angle push-ups may do the flexed-arm hang.

Objective - To measure upper body strength by maintaining flexed-arm hang position as long as possible.

Testing - Using either an overhand grasp (palms facing away from body) or underhand grip (palms facing toward body), cadet assumes flexed-arm hang position with chin clearing the bar. Cadets may be lifted to this position. Cadet holds this position as long as possible.

Scoring - Chest should be held close to bar with legs hanging straight. Timing is stopped when student’s chin touches or falls below the bar. Times are recorded in minutes and seconds.

Category 5: V-Sit Reach

Objective - To measure flexibility of lower back and hamstrings.

Testing - A straight line two feet long is marked on the floor as the baseline. A measuring line four feet long is drawn perpendicular to the midpoint of the baseline extending two feet on each side and marked off in half-inches. The point where the baseline and measuring line intersect is the “0” point. Cadet removes shoes and sits on floor with measuring line between legs and soles of feet placed immediately behind baseline, heels 8–12 inches apart. With hands on top of each other, palms down, the cadet places them on measuring line. With the legs held flat by a partner, the cadet slowly reaches forward as far as possible, keeping fingers on the measuring line and feet flexed. After three practice tries, the cadet holds the fourth reach for three seconds while that distance is recorded.

Scoring - Legs must remain straight with soles of feet held perpendicular to the floor (feet flexed). Cadets should be encouraged to reach slowly rather than “bounce” while stretching. Scores recorded to the nearest half-inch, are read as plus scores for reaches beyond baseline, minus scores for reaches behind baseline.

Cadet Fitness Monitoring

The Presidential Fitness Challenge Program is a yearlong program designed to help cadets reach and maintain fitness standards as calculated by age and gender. For cadets who do not meet the fitness standards during first individual assessment, instructors should provide a program of improvement throughout a 36-week school year. Instructors should assist cadets with establishing fitness goals; conducting periodic assessments throughout the school year will provide needed feedback on improvement. Providing feedback to cadets concerning improvement is essential if cadets are to reach their goals. This feedback will allow cadets and instructors to modify fitness programs to meet individual needs that provide progressive improvement towards a healthy, active lifestyle.

Key Exercises for Maintaining Fitness

This program provides 19 exercises which can be conducted with minimal space and with minimal climate dependency (e.g., the 1-mile run). The exercises develop all muscle groups and provide sufficient anaerobic and aerobic intensity. They require no equipment and use only body weight and common objects (e.g., chairs).
The 19 exercises are:

- V-Sit Reach
- One-Mile Endurance Run/Walk
- Push-ups
- Sit-Ups
- Lunges
- Mountain Climbers
- Plank
- Pull Ups
- Bent-Knee Push-ups
- Arm Extended Lunges
- Body Builders
- Feet Elevated Push-ups
- Reverse Extended Lunges
- Hindu Push-ups
- Hindu Squats
- Squat Leaps
- Left Arm and Right Arm Planks
- Flutter Kicks
- Extended Side Push-ups
- Side Lateral Jumps

Descriptions and standards can be found at:
WINGS | Published Files | Directory | JROTC | Wellness Program | Presidential Fitness Exercises.pdf

A typical exercise class may go as follows:

- Warm-up/Stretch
- Pick 6 or more exercises to perform depending on time
- Ensure proper form and technique
- Cadets should strive to complete the number of repetitions indicated on their personal workout plan
- Time and facilities permitting, instructors should allow cadets to participate in an organized team sport
- Cool/down/Stretch

The references below from the Leadership Education 100, 200, and 400 textbooks provide the primary academic support for the cadet Wellness Program.

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**LEADERSHIP EDUCATION (LE) ELECTIVES**

The following rules apply when using LE elective curriculum:

1. LE electives are “**ONLY**” intended to supplement, **NOT** replace Leadership Education curriculum and **WILL NOT** be used in place of AS, Drill & Ceremonies, or Wellness/PT curriculum.

2. Cadets **should not** repeat LE elective curriculum, the intent is to expose cadets to multiple citizenship opportunities as possible throughout their high school experience.
   - Units with blended classes may teach portions of LE Elective 6 each year to assist first year cadets with a basic understanding of corps requirements.

3. LE elective must receive a minimum of elective credit from school/district.

4. LE elective may be offered in place of HQ’s provided LE curriculum for only one half term of a 4x4 or Block schedule and one semester of a Trad/Tri/A-B schedule for any academic year.

5. LE elective name and description must be added to the course syllabus.

6. LE elective name and description must be added to the “Unit Defined Courses” when taught.

7. AFJROTC units must receive an approved “Holm Center/DEJ” curriculum waiver to teach content as LE elective if not on the Holm Center/DEJ approved LE elective list.

8. AS, STEM, Drill & Ceremonies, and Wellness/PT **WILL NOT** be used as LE electives.

9. LDR activities **WILL NOT** be used as LE electives.
   - Examples of co-curricular activities include CERT, Marksmanship, Orienteering, Drill Teams, and First Responder programs.

10. Instructors will be required to develop lesson plans/PPT’s if none are provided by host organization.

11. No CPS/TPC files are provided, instructors are responsible for this action if they desire to use CPS/TPC as part of the lesson presentation.

12. Refer to WINGS | Published Files | Directory | WINGS User Guides & Videos | JROTC Guides & Videos | JROTC Courses with Electives/STEM.
What Now JROTC Cadet?

Profession of Arms Center of Excellence (PACE)

On 2 March 2015, Chief of Staff of the Air Force General Mark Welsh directed the activation of the Profession of Arms Center of Excellence (PACE). PACE is tasked as the Air Force champion laser focused on infusing Air Force Core Values within the Profession of Arms.

**NOTE TO INSTRUCTORS**

Instructors wanting to add “What Now JROTC Cadet?” character development modules to their curriculum offerings **MUST** complete the mandatory PACE facilitator training. Procedures for completing this training can be found in the CMPF located at:

WINGS | Published Files | AFJROTC Curriculum | CMPF – Curriculum Mat/Pubs/Forms

“The Profession of Arms Center of Excellence is committed to developing Air Force personnel with a professionalism mindset, character, and core values required to succeed today and well into the future.”

**PACE Goals**

The goal of the “What Now JROTC Cadet?” video series is to make cadets think about moral and ethical dilemmas and appreciate how Air Force Core Values and their Virtues provide a reliable compass for making good decisions. Its focus is to assist decision-making, spur discussion and enhance character development of JROTC cadets.

When facilitated properly, each “What Now JROTC Cadet?” scenario will:

- Enhance character development through guided discussion of targeted ethical problem areas
- Promote discussion and provide decision making opportunities based on ethical/moral dilemmas in a facilitated forum
- Strengthen the ability to connect Air Force Core Values with mission accomplishment
- Foster habits of mind that lead to moral courage and ethical judgment
- Foster mental agility, adaptive behavior, and diversity of thought

**Format**

The “What Now JROTC Cadet?” module has six scenarios. One of the scenarios is to be used for instructor training only. The remaining five scenarios are stand-alone and can be presented in any order.

A scenario with facilitated discussion will normally last 45 – 60 minutes depending on the engagement of the cadets and skill of the facilitator and consists of 6 - 8 video clips that are 1 - 2 minutes in
length. Each video clip is accompanied by a guided discussion led by a trained facilitator. The scenario always begins with a main character who explains a situation and a dilemma the situation presents. Then, 4 - 5 additional characters provide their perspective of the situation and what they would do. The final character provides either a mentor’s perspective based on personal experiences or an “authoritative” perspective (including the official Air Force answer).

NOTE: “What Now JROTC Cadet?” is not designed to be completed in one school year or term, modules are intended to be spread out over a cadet’s four years in JROTC or be presented when issues similar to the provided scenarios arise on the school campus or community.

What Now JROTC Cadet? – Scenarios

The five scenario titles are:
1) Tough Call
2) The Coach
3) Truth or Dare
4) Party Time
5) It Wasn’t Me
Unlocking Your Potential (UYP)

Unit 1: You’ve Always Had the Potential

Learning Objectives:
1. Define potential.
2. Explain the difference between the “I can’t” attitude and the “I haven’t learned yet” attitude.
3. Discuss the statement: “It is not what I have, it’s what I do with what I have that determines my performance.”
4. Identify areas of their lives where they believe they are allowing “being good” to get in the way of “being great.”

Unit 2: You’re Born to Win

Learning Objectives:
1. Define conditioning.
2. Define motivation.
3. Identify habits that may be keeping them from trying something new or attaining success in certain areas of their lives.
4. Explain the “Potential V” diagram.

Unit 3: The Most Amazing Computer of All

Learning Objectives:
1. Describe the thought process (how our minds store information) and how it affects our behavior.
2. Define attitude.
3. Identify habits that may be keeping them from trying something new or attaining success in certain areas of their lives.
4. Explain how attitudes are formed.
5. Discuss the statement: *Words are tools that predict and perpetuate performance.*
Unit 4: Changing from the Inside Out

Learning Objectives:
1. Define self-image.
2. Explain how self-talk and self-image affect performance.
3. List three steps for successful change.
4. Define affirmative reminders.
5. List the conditions for writing effective affirmative reminders.
6. Discuss the statement: All meaningful and lasting change starts on the inside with self-image and works its way out.

Unit 5: You’ll See It When You Believe It

Learning Objectives:
1. Explain what Imagination x Vividness = Reality in the Subconscious means and how it relates to performance.
2. Use affirmative reminders to rehearse the desired outcome of a goal or event.
3. Discuss the statement: You move toward and become like the image of your world that you hold uppermost in your mind.

Unit 6: How to Increase Self-Confidence

Learning Objectives:
1. Explain the “Flick back, Flick up” technique (Visual Motor Behavior Rehearsal).
2. Discuss the statement: I will not be remembered by how few mistakes I make, but by how many successes I have.

Unit 7: Know You’re Good…And Wear It Well

Learning Objectives:
1. Define self-esteem – what it is and what it isn’t.
2. Explain what happens in a low self-esteem environment.
3. List seven steps for building sound self-esteem.
4. Discuss the question: Can you have too much self-esteem?

Unit 8: Success is a Journey…Not a Destination

Learning Objectives:
1. Define success.
2. Explain the difference between values and goals.
3. Identify their five uppermost values in life.
4. Make a list of personal goals.
5. List seven principles for successful goal-setting.
Unit 9: If You Fail to Plan, You’re Planning to Fail

Learning Objectives:
1. Develop and use a plan of action.
2. Discuss the statement: *Seldom do we exceed our expectations. Even if the opportunity arises, we generally fail to capitalize on it.*

Unit 10: How to Motivate Yourself and Others

Learning Objectives:
1. Define and give examples of three types of motivation.
2. Explain why it is important to catch people in the act of doing things right.
3. Discuss the statement: *Treat people as they are and they will remain that way.*

Unit 11: What Employers Expect from a Great Employee

Learning Objectives:
1. Explain why attitude is the key to employment success.
2. List three ways to develop and maintain good employee attitudes.
3. Complete an employment application.
4. Discuss the statement: *We hire attitudes. We train for skills.*

Unit 12: You Never Get A Second Chance to Make a First Impression

Learning Objectives:
1. List what percentage of our communication is verbal, nonverbal, and extra-verbal.
2. Define understanding.
3. Demonstrate two techniques for improving communication skills.

Unit 13: Taking Responsibility for Your Life

Learning Objectives:
1. Use words like *want to, can, choose to,* and *will* to replace words such as *have to, can’t and should.*
2. Discuss the statement: *It’s not what happens to me; it’s what I do with what happens to me that counts.*

Unit 14: Qualities of Peak Performers

Learning Objectives:
1. List ten characteristics of high-performance individuals.
2. Discuss the statement: *Attitude, not aptitude, will give you attitude for life.*
Financial Readiness
(Financial Education Foundation)

This material is intended to provide the building blocks of long-term financial readiness through straightforward, relatable and easy to understand content written at the student’s level but also as though the audience is an adult trying to learn these topics. The result is mature, real-world messaging and education delivered in a manner easily consumed by a high school student.

Unfortunately, in today’s often materialistic and social media-driven world, it’s common for young people to get off on the wrong foot financially and then spend years or even decades trying to get on a better path. These digital publications and the conversations they can stimulate, both in the classroom and at home, have the potential to create a different outcome: one in which students move into adulthood better informed and better equipped to make better financial decisions.

This material is aligned with LE 300: Life Skills & Career Opportunities; Chapters 1 & 2, and Chapter 4, Lesson 1. Units may order 1 DVD containing the YDraw videos and 1 DVD containing the digital copies of financial readiness pamphlets. Units will be responsible for printing the financial readiness pamphlets from the DVD.

VT-34 LE 300: Financial Readiness YDraw Videos (DVD)
VT-35 LE 300: Financial Readiness Pamphlets (DVD)

DVDs may be ordered in WINGS | Logistics | Create-Display Orders

To plant the seeds for long-term financial readiness, we teamed up with a large, non-profit financial readiness education foundation to create six digital financial readiness publications. The topics covered are:

1.) Financial Planning and Goal Setting
2.) Building Your Savings
3.) Buying a Vehicle
4.) Understanding Credit
5.) Managing Debt
6.) Financing College
The NEFE HSFPP is a six-unit classroom curriculum that consists of six modules. The student guides are to be used as a workbook for the student. The NEFE High School Financial Planning Program® was designed for the 11th and 12th grade level, though the curriculum text is written at the 5th to 8th grade level. The high school program specifically focuses on basic personal finance skills that are relevant to the lives of pre-teens, teens, and young adults to lay a solid foundation for financial independence and future financial decisions.

The NEFE High School Financial Planning Program® has been correlated to educational standards in every state with financial literacy standards. In addition, it has been benchmarked against seven national educational standards in specific subject-matter areas. The HSFPP is the only financial literacy education program to have done this. The HSFPP curriculum is built around seven target competencies, forty-three learning objectives and fifty-three learning outcomes. The target competencies and learning objectives are used in the standards cross-walks which can be found at http://www.nefe.org/HighSchoolProgram. The files are in PDF format and can be downloaded for your use.

**Program Goals: Leading to life-long learning and application**

As a result of taking part in the NEFE High School Financial Planning Program, students will build confidence, apply practical skills, and exhibit sensible behaviors related to money management. Specifically, they will:

- **Build confidence to make financial decisions** related to managing personal financial resources, building earning capacity, protecting assets, and adapting to unexpected events.

- **Apply sound foundational financial decision making principles** immediately after completing the program and in the future.

- **Exhibit mindful money management behaviors** that will be of immediate and future benefit to themselves and their families.

**Program Outcomes: Laying a solid foundation**

Mastery of lesson competencies will lead to varying degrees of mastery of the High School Financial Planning program outcomes.

- Manage personal spending to meet financial goals and minimize the impact of financial obstacles [Money Management]
● Control personal credit and debt [Borrowing]
● Boost personal earning capability [Earnings]
● Put personal assets to work to build personal wealth [Saving, Investing]
● Use financial services in sensible and wary manner [Financial Services]
● Protect personal property and financial resources [Insurance]

Throughout the program students will reinforce skills that relate to multiple program outcomes. These skills are:

● Set SMART financial goals
● Use a decision making process to weigh the options and consequences when making spending decisions
● Analyze how personal values impact spending, saving, and planning behaviors
● Utilize resources that are credible and timely
● Manage personal financial records

**Module 1: Money Management**

1-1 Money Habits: Explore how spending, saving and values impact your finances
1-2 Goals: Set financial goals that are specific and measurable.
1-3 Decisions: Apply strategies to be mindful about spending decisions.
1-4 Spending Plan: Create a spending plan to reach goals.
1-5 Cash Flow: Figure out ways to maintain a positive cash flow.

**Module 2: Borrowing**

2-1 Weigh the benefits and risks of borrowing.
2-2 Compare the costs and terms of borrowing options.
2-3 Start the journey to establishing a good credit rating.
2-4 Explore the rights and responsibilities of borrowers and lenders.
2-5 Protect yourself from identity fraud.

**Module 3: Earning Power**

3-1 Explore the payoffs of investing in yourself.
3-2 Measure the value of employee benefits.
3-3 Assess factors that impact personal tax liability and take-home pay.
3-4 Start down the path to achieving your lifestyle and financial goals.
3-5 Prepare to deal with life and work changes.

**Module 4: Investing**

4-1 Explore how saving and investing can be used to build wealth.
4-2 Explore how investing works.
4-3 Explore the risks and rewards of investment options.
4-4 Summarize basic investment strategies.
4-5 Outline a long-range investment game plan.

**Module 5: Financial Services**

5-1 Explain how services are used to handle business transactions.
5-2 Select banking tools and technology to handle personal business transactions.
5-3 Protect your personal account information.
5-4 Select a financial service provider.
5-5 Demonstrate how to manage spending and banking transactions.
**Module 6: Insurance**

6-1 Justify reasons to be insured.
6-2 Investigate how insurance works.
6-3 Choose insurance for specific needs and situations.
6-4 Compare auto insurance options.
6-5 Plan ahead to minimize insurance costs and costs of unexpected events.

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**The Complete Guide to College Financing & Admissions**

*The Complete Guide to College Financing & Admissions* is a step-by-step approach to college financing and admissions. This revolutionary program provides critical information and hundreds of web links that connect students directly to everything they need to know to save thousands of dollars in college costs and get them into the college of their choice. *Zero Hour Threat* is an SAT and ACT Test prep game and *The Studyworks Complete Guide to SAT Preparation* is an essential guide to the SAT.

*The Complete Guide to College Financing & Admissions* is a powerful tool to support the Leadership 300: Life Skills and Career Opportunities course. Over the past several years, the packaging has changed, but the content remains consistent. The program has:

- *The Complete Guide to College Financing & Admissions*
- *The Successful Student Guides to the SAT-ACT* eBooks (e.g., *The Essential Guide to the SAT* and *The Essential Guide to the ACT*)
- *ZERO Hour Threat I and II* — SAT and ACT Prep Game
- *College Options Foundation’s Student Planning Guide*

The following College Options college preparation materials may be ordered through **WINGS | Logistics | Display/Create Orders**

| DVD-9094 | Total College Solutions | 2011 |
| DVD-9095 | The Complete Guide to College Financing and Admissions | 2009 |
| DVD-9096 | The Studyworks Complete Guide to SAT Preparation | 2009 |
| DVD-9097 | SAT/ACT Test Prep Game | 2009 |
**Congressional Medal of Honor Foundation**

The Congressional Medal of Honor Foundation provides supplemental teacher resources/DVDs *free of charge*. *Medal of Honor: Lessons of Personal Bravery and Self-Sacrifice* is a resource designed by teachers to provide students with opportunities to explore the important concepts of courage, commitment, sacrifice, patriotism, integrity, and citizenship and how these values can be exemplified in daily life. Contact them directly to obtain the materials (see the CMPF).

**The Pennsylvania Veterans Museum**

The Pennsylvania Veterans Museum provides supplemental teacher resources/DVDs *free of charge*. The museum is dedicated to preserving, protecting, and promoting the legacy and dignity of all veterans of the U.S. military. Their focus is to tell the stories of America’s conflicts through the eyes of those who served in them. See the section on curriculum videos for complete descriptions of the DVDs. Contact them directly to obtain the materials (see the CMPF).

- *On Freedom’s Wings: Bound for Glory* (Legacy of the Tuskegee Airmen)
- *The American Humanitarian Effort: Out-takes from Vietnam*
- *Their Sacrifice, Our Freedom: WWII in the Pacific*
- *Their Sacrifice, Our Freedom: WWII in Europe*
- *In The Company of Heroes (101st Airborne: Screaming Eagles)*
- *Women in the Military: Willing - Able - Essential*

**Veterans National Education Program**

This organization provides supplemental educational materials *free of charge* teaching U.S. modern history through the understanding of the humanistic and cultural aspects of America’s military conflicts and how they have influenced the fabric of our global society. Contact them directly to obtain the materials (see the CMPF).
Leadership Education 400: Principles of Management

This is the fourth textbook in the Leadership Education series. This course provides exposure to the fundamentals of management. The text contains many leadership topics that will benefit students as well as provide them with some of the necessary skills needed to put into practice what they have learned during their time in AFJROTC. We are confident this course, coupled with what cadets have already learned during their time in AFJROTC, will equip them with the qualities needed to serve in leadership positions within the corps. Throughout the text are many ethical dilemmas, case studies, and role play activities built into the lessons. These activities are based on real life experiences and will allow students the opportunity to practice what they learn by getting involved in discussions and expressing their opinions.

Course Objectives:

After successfully completing the Leadership Education 400: Principles of Management course the student will:

1. Know the history and the importance of management.
2. Know the techniques and skills involved in planning and decision making.
3. Know the importance of managing change, stress, and innovation.
4. Know the key elements of individual and group behavior, the importance of the communication process, and the characteristics of a good leader.

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Unit One

Introduction to Management

Chapter 1: Managers and Management

1. Chapter Objectives
   a. Know who managers are.
   b. Know where managers work.
   c. Know what management is.
   d. Know what managers do.

2. Chapter In Brief

Chapter 1 consists of two lessons. Lesson 1 “Management Basics” begins by addressing who managers are, where they work, what management is, and what managers do. Management is defined as well as the titles of top managers. Management processes are covered and defined. Students will learn why people perform better when managers work well with team members. Students will also learn about making decisions and dealing with change.

Lesson 2 “Management in the Marketplace” covers such topics as the skills and competencies successful managers possess; the importance the marketplace puts on managers; why management is worth studying, and how management relates to other disciplines. Emphasis is placed on specific skills and competencies managers need to possess in order to be effective. There is discussion on the results good managers produce and the pay associated with management positions which will convey to students why management is worth studying. Lastly, students will learn how management skills relate to other disciplines of study such as political science, psychology, anthropology, economics, philosophy, and sociology, etc.
Chapter 2: The Historical Roots of Contemporary Management Practice

1. Chapter Objectives
   a. Know the history of management before the modern era.
   b. Know the classical contributions to modern management.
   c. Know the human resources approach to management.
   d. Know the quantitative approach to management.
   e. Know how social events shape management approaches.
   f. Know management approaches today.

2. Chapter In Brief
Chapter 2 contains two lessons. Lesson 1 is titled “Management Theories”. The ways that historical theories currently influence what managers do today is discussed. Students will see the important links between past theories, present actions, and future innovations. They will learn that today’s innovations have many of their roots in the past. There is information on the contributions that Adam Smith, Henri Fayol, Frederick Taylor, and Max Weber made to the field of management. Students will learn about the influence the industrial revolution had on management practice as well as classical contributions to modern management and how classical writings are applied today.

Lesson 2 is titled “Management Approaches” and places emphasis on the various approaches to management used today to include the process approach, systems approach, and the contingency approach, and the different points of view that people have toward management. Students will learn that some approaches are more oriented to treating people well and others are more oriented to structured practices and processes. Emphasis is placed on the importance of considering both the satisfaction of workers and the efficiency and effectiveness of work. There are discussions on the contributions and views of Hugo Munsterberg, Mary Parker Follett, Chester Barnard, Dale Carnegie, Abraham Maslow, Douglas McGregor, and Robert McNamara, etc.
Chapter 3: The Management Environment

1. Chapter Objectives
   a. Know about management and the changing economy.
   b. Know about the global marketplace.
   c. Know about management and technology.
   d. Know what society expects from organizations and managers.
   e. Know how entrepreneurship impacts society.
   f. Know about the workforce and labor.

2. Chapter In Brief

Lesson 1 “Management and the Economy” makes students aware of management and the changing economy, the global marketplace, and management and technology. Students will learn that the effects of globalization and technology are absolutely critical. The lesson discusses Alvin Toffler’s argument that modern civilization has come in three waves: agriculture, industrial, and information. The global marketplace is discussed with emphasis on the globalization of business and how globalization affects organizations and managers.

Management and technology are discussed as well as how an organization benefits from information technology and how technology alters a manager’s job.

In Lesson 2, “Management and Society”, students will learn about the way in which society impacts the work of managers. They will also learn that the social issues managers face are complicated due to the influence of a variety of social factors. They will also learn what society expects from organizations and managers, how organizations demonstrate socially responsible actions, and how managers become more socially responsible. Three views of ethics are discussed: the utilitarian view, the rights view and the theory-of-justice view. There is discussion on entrepreneurship, the entrepreneurial process, what entrepreneurs do, and entrepreneurs within large organizations. Students will learn about the workforce and labor and what today’s workforce looks like. Students will learn how diversity affects organizations and how organizations help employees with work/life balance. Finally, there is information on a pending labor shortage in the United States and two factors that contribute to that labor shortage.
Unit Two

Planning

Chapter 4: Foundations of Planning

7. Chapter Objectives
   a. Know what planning is.
   b. Know about planning in uncertain environments.
   c. Know types of plans.
   d. Know about management by objectives.
   e. Know approaches to establishing goals.
   f. Know about developing plans.
   g. Know about contemporary issues in planning.

2. Chapter In Brief

Lesson 1 “Planning Basics” defines planning. Students will learn about planning and what it involves. They will read about the arguments for and against formal planning and about the different kinds of plans – strategic versus tactical; directional versus specific; short term versus long-term; and single-use versus standing plans. Students will study about management by objectives and why many businesses today involve their employees in setting performance objectives to meet organizational goals. They will learn how to set employee objectives and how a manager helps employees set work goals. Students will also learn how an influential thinker in the quality-management field thinks goal-setting may do more harm than good.

Lesson 2, “Establishing Goals and Developing Plans”, places emphasis on the different approaches to establishing goals, characteristics of well-thought-out goals, and steps in goal setting. Students will learn the three contingency factors managers must consider as they plan. The last topic covered is “contemporary issues in planning” and includes criticisms of planning. Students are given steps they can take now toward becoming a manager.
Chapter 5: Foundations of Decision Making

1. Chapter Objectives

   a. Know what defines a decision problem.
   b. Know the rational model for decision making.
   c. Know about modification of the rational model.
   d. Know the contingency approach to decision making.
   e. Know decision-making styles.
   f. Know about making decisions in groups.
   g. Know about culture and decision making.

2. Chapter In Brief

   In Lesson 1 “The Decision-Making Process” students will learn that the decision-making process is a set of eight steps. They will learn that decision making is a critical skill for life. They will learn the definition of a decision problem and the eight steps used to define a decision problem. Focus is given on what is relevant in the decision-making process and how the decision maker weighs the criteria. The lesson further places emphasis on the rational model for decision making, why creativity is important in decision making and common errors in the decision-making process.

   Lesson 2 is titled “Decision-Making Challenges” and stresses the different types of problems we have to solve and the different ways we approach decision making when we are working to solve those problems. There is discussion on how problems differ and the different levels in the organization. Students will learn how technology aids in decision making. They will also learn the four basic decision-making styles. Lastly, the students will learn about culture and decision making.
Unit Three
Organizing

Chapter 6: Managing Change, Stress, and Innovation

1. Chapter Objectives
   a. Know the forces for change.
   b. Know two views of the change process.
   c. Know about employee resistance to change.
   d. Know about changing the organization.
   e. Know about change and stress.
   f. Know how to stimulate innovation.
   g. Know about handling personal stress.
   h. Know about time management.
   i. Know about time management and meetings.

8. Chapter In Brief

Chapter 6, Lesson 1 titled “Managers and Change” emphasizes forces for change and external forces that create a need for change. Students will be allowed to think through the causes of change and respond to the changes they have experienced. Discussion of the different approaches to change should help students understand the ways in which people resist change. Emphasis is placed on the two views of the change process, why people resist change, and some techniques for reducing resistance to organizational change.

Lesson 2 “Change and the Organization” explains the connections between change, stress, and innovations in organizations. Emphasis is placed on the necessity of change for organizations to stay competitive and shows how this makes it necessary to address stress and encourage innovation in organizations. There is discussion on change and stress, common causes of stress, symptoms of stress, and how managers can act to reduce stress. Lastly, students will learn how to stimulate innovation and how creativity and innovation are related.

Lesson 3 “Managing Yourself, Stress, and Time Management” stresses the importance of self-management. Emphasis is placed on the fact that stress cannot be avoided, but it can be managed. There is discussion on how to handle personal stress, how to survive stress, and how to make stress work for you. Students will learn that time management can be a positive or a negative stressor and how to set priorities on their time. There is discussion on time management and meetings and tips are given on how to conduct effective meetings.
Unit Four
Leading

Chapter 7: Foundations of Individual and Group Behavior

1. Chapter Objectives
   a. Know about explaining and predicting behavior.
   b. Know about personality theories.
   c. Know about perception.
   d. Know how people learn.
   e. Know about foundations of group behavior.

2. Chapter In Brief

The first lesson in Chapter 7 “Behavior and Personality”, talks about how to explain and predict behavior and the goals of organizational behavior. The students will learn how attitudes and actions impact the way we approach work. Specific examples are given of personality traits and how these traits impact our productivity, absenteeism and turnover, attitudes, and organizational citizenship. The students will learn if an individual’s attitude and behavior must be consistent and how understanding attitudes helps managers be more effective. They will also take a look at several personality theories including The Myers-Briggs Type Indicator® and The Big Five Model®. Students will also take a look at five specific personality traits that have proven most powerful in explaining individual behavior in organizations. Lastly, students will learn about the various basic employee personality types and how to match these personalities with jobs.

Lesson 2 “Managers and Group Behavior” reinforces the point that you cannot judge people simply by their appearance. Emphasis is placed on how learning, setting a good example, reinforcing positive contributions, and establishing appropriate group norms are critical to managing groups. In addition, students will study about perception and what influences it; and shortcuts managers use in judging employees. Lastly, students will focus their attention on the basic concepts of group behavior and how norms and conformity and group size affect group behavior.
Chapter 8: Understanding Work Teams

1. Chapter Objectives
   a. Know about the popularity of work teams.
   b. Know the types of work teams.
   c. Know the characteristics of high-performance teams.
   d. Know about turning individuals into team players.
   e. Know contemporary team issues.

2. Chapter In Brief

   Lesson 1 of Chapter 8 “Work Teams” informs students about the popularity of work teams and the stages of team development. Emphasis is placed on the increasing use of teams due to changes in the market place. Students will learn that as more and more organizations are faced with rapidly changing environments, the need for people to work together effectively to solve problems and respond to changes is more and more important. Students will also learn how teams differ from work groups. They will cover how teams work and what kinds of skills team members need to have as well as the different types of work teams. Virtual teams in the 21st Century are covered which includes conference calls, videoconferencing, and email to solve problems across the time zones.

   Lesson 2 “Managing Teams” highlights the importance of teams in our culture as well as the challenges we face in working as team members in an individualistic culture. Emphasis is placed on the necessity of managing teams, turning individuals into team players, and the roles team members play. Contemporary team issues such as “how workforce diversity affects teams” is also covered. Students will study about ways to reward team contributions over and above individual contributions.
Chapter 9: Communication and Interpersonal Skills

1. Chapter Objectives
   a. Know the communication process.
   b. Know about communications and information technology.
   f. Know about listening and feedback skills.
   g. Know about delegation skills.
   h. Know about managing conflict.
   i. Know about negotiating skills.
   j. Know about writing evaluations.

2. Chapter In Brief

The first lesson in Chapter 9 is entitled “Communication Skills and Challenges”. This lesson focuses on communications skills and challenges by emphasizing the importance of communication in almost everything we do. The communication process is discussed in detail to include barriers to effective communications and why you should listen actively. Communication and information technology is also discussed.

Lesson 2 of Chapter 9 “Developing Interpersonal Skills”, explains the importance of interpersonal skills for success. Emphasis is placed on the need to listen to more than just the opinions people have, but to listen to the attitudes and emotions that influence those opinions. Listening and feedback skills as well as the difference between positive and negative feedback are discussed. Tips on how to give effective feedback are also discussed. Students will learn why active listening skills are important. Delegation skills and how to delegate effectively are discussed; and managing conflict is also covered. Students will learn that conflict is normal and can be positive and negative. They will learn that they cannot resolve all their conflicts, but that they can learn to manage conflict in constructive ways. Negotiating skills are discussed and writing evaluations is covered. There is focus on the purposes of performance evaluations and the appraisal interview.
Chapter 10: Leadership and Trust

1. Chapter Objectives
   a. Know about managers versus leaders.
   b. Know the trait theories of leadership.
   c. Know the behavioral theories of leadership.
   d. Know the contingency theories of leadership.
   e. Know the emerging approaches to leadership.
   f. Know about leadership today.
   g. Know about building trust: the essence of leadership.
   h. Know the definition of coaching and mentoring.
   i. Know about goal setting.
   j. Know about giving feedback.
   k. Know about developing protégés.

2. Chapter In Brief

   Lesson 1 “Leadership Theory” focuses on managers versus leaders and leadership theory by explaining how the traits and behaviors of a leader as well as the situation the leader faces all impact how well a leader performs. Emphasis is placed on the fact that some leaders who may be very effective in one situation would not be nearly so effective in a different situation and how leadership style should generally be adapted to the demands of different circumstances. Finally there is discussion on emerging approaches to leadership.

   In Lesson 2 “Leadership Issues”, emphasis is placed on leadership today and how leading teams is more and more important in today’s workplace. There is discussion on how national culture and emotional intelligence affects leadership. Building trust and the five dimensions of trust are discussed with emphasis on the essential nature of trust for effective leadership and explanations on how expectations of leaders differ from one culture to the next.

   In Lesson 3 “Effective Coaching and Mentoring”, the differences between the role of a coach and the role of a mentor are explained. Mentoring the Air Force way is covered. Emphasis is placed on the importance of setting goals and providing feedback as a means for helping people improve performance and enhance their ability to succeed.
Supplemental materials are provided to enhance the learning experience for cadets in the content area you are teaching. Instructors choosing to include supplemental material to reinforce HQ’s provided curriculum should include this material when defining the unit course in WINGS.

Supporting material included during daily classroom instruction that exceeds 10% of the Defined Course **MUST** be defined by going to WINGS | Unit Management | Curriculum | JROTC Unit Defined Curriculum.

If less than 10% of the programmed instructional time, a waiver is not required and it does not have to be part of the “defined course,” but does need to be reflected in the course syllabus. Supplemental materials must not exceed 10% of instruction time without a waiver approved by Holm Center/DEJ.

**The supplemental materials listed below are no longer part of the AFJROTC provided curriculum.** However, if your unit has these materials and you are able to enhance your learning environment by using them, please feel free to continue using the material. If you do not have any of these materials, we apologize that we will not be able to furnish them to you because some of the items are obsolete and/or have been replaced with more current material.


**Basic Aviation Physiology:** Can you recognize the onset of hypoxia? Do you know how to compensate for visual illusions that can put you in a dangerous situation? These are just two of the many things you will learn by viewing this videotape. It describes how the different sensory organs give you inputs in flight and how to analyze those inputs. It continues with sections on spatial disorientation, the effects of altitude on the human body, and the reduction in your performance caused by alcohol or drugs.

**Weather Hazards:** Thunderstorms, wind shear, and microbursts can present serious hazards to your flight operations. This FlghtTime video program helps you understand the forces behind these phenomena. It shows you the inner workings of a thunderstorm, the varied sources of wind shear, and the tremendous destructive power of microbursts. By increasing your understanding of these subjects, you will improve your ability to avoid the associated hazards.

**Weather Flight Planning and the Pilot:** Today, you have more options than ever before for obtaining a weather briefing. This video shows the various weather sources and services available and covers some of the common errors in the briefing process.

**Final Approach Fix Inbound:** The final approach is a crucial phase of any flight, especially in instrument conditions. This video helps you analyze how obstacles, clearance, and protected airspace vary for different types of approaches. It discusses the unique considerations of various kinds of procedures, and it also gives you practical tips for flying the final approach segment.
**Mountain Flying:** Flying in the mountains presents its own unique challenges and rewards. This video provides information and techniques for flying in the mountains and how to avoid the associated hazards. You can use this video as an introduction to mountain flying before you get a checkout, as a review of mountain flying, or just to broaden your knowledge of different types of flying.

**Aircraft Icing:** Aircraft Icing emphasizes the many forms of icing and provides effective techniques for avoiding or dealing with the associated hazards. It presents valuable information for both VFR and IFR pilots.

**Flight Kit:** Symbolizes our commitment to math and science education, preparing today’s youth for life in the 21st century. It was produced by McGraw-Hill’s Aviation Week & Space Technology magazine and School Publishing Company and made possible by a group of leading aerospace companies.

**Where There’s A Will, There’s An “A”:** This package contains two VHS videotapes and manual. The course guides students to better learning. It is a step-by-step training program to help students achieve higher grades with less effort, less pressure, and less anxiety. It may supplement any of the leadership courses and apply to any of the aerospace courses.

**Consumer Economics:** A 3-part series designed to educate students about the basics of earning, spending, and saving money.

   a. *Addicted to Debt* takes a serious look at debt and features information and tips on how to avoid and manage debt.
   b. *Money: Save It, Use It, or Lose It* discusses savings, credit, and debt and how they relate to needs and wants.
   c. *Credit: Friend or Foe?* teaches students how to establish credit and manage it effectively.

   This series is one of the best and most informative tape series available anywhere.

**Violence To-Go:** Consists of a 12-minute video story and an easy-to-use Resource Guide with factual information and student activities to reinforce key topics. The video story, *Violence To-Go* contains no violent scenes or inappropriate language but will have students sitting on the tips of their seats. The Resource Guide contains 7 Student Activities with sample lesson plans.

**Physics of Flight:** Offers an exciting new way to teach and learn physics. *Physics of Flight* teaches basic physics concepts as they relate to flight, as well as highlights the relationship between science, research, and engineering design. Students will enjoy *Physics of Flight*’s visual approach to learning physics as they look inside the cockpit of jets and gliders, reading real flight instruments to study physical forces.

**NASA 25 Years: The Greatest Show in Space:** An award winning video series. It is a 10-volume series.

**Visual Information Libraries:** Additional supplementary materials may be obtained from the following:

   a. Air Force films listed in AFP 700-34, Air Force Catalog of Visual Information Production, may be ordered from, Joint Visual Information Activity, Toby Hana, PA 18466-5102.
   b. FAA films are listed in the FAA Film Catalog. Order from Film Library, AC44-15, Film Service, c/o Modern Talking Picture Service, Inc., Park Street North, St. Petersburg FL 33709-2800.
   c. NASA films are listed in the NASA Film and Video List. Order from the NASA Regional Film Library that serves your state or territory.
**Honor and Glory:** Their elegant drills are as precise as a Swiss clock. Their rhythmic cadences evoke 200 years of order and unity. Their music stirs a nation's pride. They are the honor guard units of America's military; soldiers whose skills dazzle the world. Get a rare look inside these elite teams, from the rigorously selective acceptance process through the notoriously intense training. Watch in awe as the Marine's famed Silent Drill Platoon spins and tosses bayoneted M1 rifles for 10 minutes without a word. Work escort duty with the legendary Old Guard, the oldest active unit in the Army and march with the prestigious 144-piece Marine Band, known as "The President's Own."

**People, Power, and Mission (Air Force History):** The stirring, visually-rich history of the United States Air Force is presented in compelling style, featuring rarely seen footage. The Air Force Association has joined the Emmy Award-winning production team of Russ Hodge and Tim White and a production staff with more than a half dozen Emmys to commemorate the 50th anniversary of the USAF. This video features interviews with General Brent Scowcroft, General Michael Dugan, Senator Ted Stevens, and Air Force Historian Richard Hallion, as well as more than a dozen interviews with the everyday men and women who have made the USAF the best in the world.

**Wings Over Europe:** Relive the history of the air war over Europe. Blitzkrieg: Screaming Stuka dive-bombers rain destruction on Allied troops. In the sky above Europe, Spitfires, Messerschmitt’s, Mustangs, and Focke-Wulfs fight it out. Over Britain, the RAF, with a few brave fighters, stands off the concentrated might of the Luftwaffe. It was a time of great deeds and great planes. Now The Discovery Channel brings you the story of those great planes, and the men who flew them.

**Wings Over The Gulf:** Is a new technology; and a new kind of war. Some of the most important aircraft that flew in Operation Desert Storm are profiled stem-to-stem. Wings Over The Gulf features recently de-classified military combat footage. You will see all the hardware, the tacticians, the high-risk missions, and the men who flew them. In Harm’s Way: Tornado – The sleek, sophisticated, European strike plane. A-6 Intruder – The backbone of the Navy’s air campaign. The Final Assault: F-16 Falcon – The multi-role work horse of the Gulf War. A-10 Thunderbolt II – The deadly “warthog” built for punishment.

**Nighthawk: Secrets of the Stealth Fighter:** An unprecedented look at America’s super weapon. After years of secrecy, rumors, lies and controversy, the F-117 Nighthawk proved itself in battle during the Gulf War. Now this action-packed video gives you total access to the Stealth’s classified history – and an exclusive chance to see it in action.
The purpose of the NASA Educator Resource Centers is to help teachers learn about and use NASA’s educational resources. Personnel at ERCs located throughout the United States work with teachers to find out what they need and to share NASA’s expertise. The ERCs provide educators with demonstrations of educational technologies such as NASA educational Web sites and NASA Television. ERCs provide in-service and pre-service training utilizing NASA instructional products. Educators also have the opportunity to preview, copy, and receive NASA instructional products.

The Field Center ERCs are located on or near NASA centers. These ERCs service educators from states within their geographical region. These ERCs have a close association with NASA specialists, scientist, and engineers who often act as resources for workshops and special events.

The Educator Resource Centers by State listing include the Field Center ERCs, along with ones that are located in planetariums, museums, on college or university campuses, or other nonprofit organizations. These ERCs often have partnerships with their state’s education department or regional educational organizations. They also may be part of a resource center that offers educational resources in addition to NASA related ones. Most states have one ERC, but a few have more than one. Additionally, you can find NASA teaching materials at http://search.nasa.gov/search/edFilterSearch.jsp?empty=true

To locate an Educator Resource Center by state, go to: http://www.nasa.gov/offices/education/programs/national/ercn/home/ERCN_State_Listing.html

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| ARKANSAS: Center for Mathematics and Science Education NASA RERC; Fayetteville, AR |
| CALIFORNIA: NASA Ames Research Center Educator Resource Center; Moffett Field, CA |
| NASA Dryden Flight Research Center Educator Resource Center; Palmdale, CA |
| NASA Jet Propulsion Laboratory JPL Educator Resource Center Village at Indian Hill; Pomona, CA |
| California Science Center Amgen Center for Science Learning; Los Angeles, CA |
| California State University, Fresno Instructional Technology and Resource Center; Fresno, CA |
| Endeavour Center Maple High School; Vandenberg Air Force Base, CA |
| COLORADO: Space Foundation Discovery Institute NASA RERC; Colorado Springs, CO |
| CONNECTICUT: Eastern Connecticut State University NASA ERC; Willimantic, CT |
| DELAWARE: Delaware Aerospace Center; Bear, DE |
| DISTRICT OF COLUMBIA: University of the District of Columbia Science &amp; Engineering Center; Washington, DC 20008 |
| FLORIDA: NASA Kennedy Space Center Educator Resource Center; J.F. Kennedy Space Center, FL |</p>
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