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PROGRAM CONCENTRATION: **Government & Public Safety**
CAREER PATHWAY: **JROTC – Air Force**
COURSE TITLE: **Aerospace Science: A Journey Into Aviation History**

Air Force Junior ROTC Curriculum
The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." **McREL** Standards and Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, **McREL** is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the **National Council on Social Studies** (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the **Georgia Performance Standards** for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

All McREL Standards and Benchmarks are available for AFJROTC instructors and authorized users at https://owa.afjrotc.net/cybercampus_prod/default.aspx in the Library under Curriculum, McRel Standards and Benchmarks. Additional national education standards are referenced in this copyrighted cybercampus information. Georgia AFJROTC instructors should reference both the Georgia and McREL standards to meet both AFJROTC and Georgia student education requirements.

Aviation History content and process skills on the AFJROTC Cybercampus have been correlated to *Project 2061: Benchmarks for Science Literacy* by the American Association for the Advancement of Science, National Assessment of Educational Progress (NAEP): 1990 Science Objectives, National Research Council **(**NRC**)** (functioning under the auspices of the National Academy of Sciences): National Science Education Standards, and National Center for History in the Schools (NCHS): World History.

Course Description:
The aviation history course provides students a background of the development of flight from early myths to the present as part of an historical overview of American warfare. Students will focus on aviation issues, objectives, strategy, technology, scientific advances, forces, milestones, and assessments. Students examine major figures in aviation history while investigating the heritage of flight, the development of air power

through the use of scientific knowledge, the historic role of airpower during wartime, aerospace aviation technological advances, and contemporary aviation.

PS-AFAH-1. Students will understand historical continuity and change related to mankind's early attempts to fly from ancient times, starting with the Chinese and going to DaVinci.

a. Describe the early Chinese kites and rockets
b. Identify Leonard DaVinci's contributions to flight
c. Explain the principle of bird flight, how man tried to mimic birds in flight, and why man and machines do not fly the way bird fly.

Academic Standard(s):
SSWH9 The student will analyze the change and continuity in the Renaissance and Reformation.

PS-AFAH-2. Students will investigate the development of lighter-than-air flight.

a. Compare and contrast the use of balloons during the US Civil War and the Spanish American War.
b. Explain the manufacturing advancements and scientific discoveries during the development of heavier-than-air aircraft from DaVinci to the Wright brothers.
c. Explore the lives and contributions of all the inventors listed in the text who contributed to flight from DaVinci to the Wright brothers.

Academic Standard(s):
SSWH9 The student will analyze the change and continuity in the Renaissance and Reformation.

NCHS: Basic Edition, p. 101. Understands military events that influenced the outcome of the Civil War.

NCHS: U.S. History, Expanded Edition, p. 125. Understands military events that influenced the outcome of the Civil War.

PS-AFAH-3. Students will analyze the specific ideas and beliefs that lead to the success of the Wright brothers in achieving heavier-than-air flight.

a. Analyze the effect of "chance events" and specify how these events led to the Wright brothers' success.
b. List the principles of air flight.
c. Explain how the consequences of human intentions were influenced by the means of carrying them out in examining the contributions of the early aviation pioneers.
d. Identify the anatomy of the early aircraft.

Academic Standard:
SCSh7 Students will analyze how scientific knowledge is developed. Students will recognize that:

PS-AFAH-4. Students will analyze the specific ideas and beliefs that lead to the success of other pilots and inventors following the Wright brothers in 1903 until World War I.

a. Explain how the consequences of human intentions were influenced by the means of carrying them out in examining the contributions of the early aviation pioneers.
b. Identify the early aircraft by name and explain the significance of each.
c. List the various pilots/inventors who contributed to flight during this period as well as their contributions and their personal information including what drove them to fly.

Academic Standard:
SCSh7 Students will analyze how scientific knowledge is developed. Students will recognize that:

PS-AFAH-5. Students will explain the contributions aircraft and pilots had during WWI and how the aircraft revolutionized war.

a. Identify the contributions military pilots made to flight during WWI and explain the long lasting implications of each contribution.
b. List the various roles the aircraft played during WWI and how they revolutionized war tactics.
c. Explain all the new developments in aviation during WWI and analyze why these developments were intensified during the war.

Academic Standard(s):
SCSh7 Students will analyze how scientific knowledge is developed. Students will recognize that:

NCHS: Basic Edition, p. 113. Understand influences on the outcome of World War I.

NCHS: U.S. History, Expanded Edition, pp 174, 176-177. Understand influences on the outcome of World War I.

PS-AFAH-6. Students will identify the significance of and major contributions of the barnstormers after WWI.

a. Create a timeline identifying the major milestones and aviation pioneers who achieved those milestones between WWI and WWII.
b. Explain how public sentiment and awareness was awakened by the barnstormers and has continued to influence development of flight.

Academic Standard(s):
SSUSH16 The student will identify key developments in the aftermath of WW I.

NCHS: Basic Edition, p. 113. Understand influences on the outcome of World War I.

NCHS: U.S. History, Expanded Edition, pp 174, 176-177. Understand influences on the outcome of World War I. Understands arguments and theories regarding the causes of World War I.

PS-AFAH-7. **Students will identify the significance of trans-Atlantic flight and the contributions of Charles Lindberg and Amelia Earhart to flying.**

a. Explain the concept of a milestone flight and identify the various milestones that occurred from the Wright brothers to Charles Lindberg and Amelia Earhart.
b. Describe mainstream and determine why flight became mainstream during this period.
c. Identify the aircraft involved in the first aerial refueling and detail how this feat was accomplished.

Academic Standard(s):
SSUSH16 The student will identify key developments in the aftermath of WW I.

NCHS: Basic Edition, p. 113. Understand influences on the outcome of World War I.

NCHS: U.S. History, Expanded Edition, pp 174, 176-177. Understand influences on the outcome of World War I. Understands arguments and theories regarding the causes of World War I.

PS-AFAH-8. Students will identify the significance of the further development of commercial aircraft.

a. Describe the various steps and personnel involved in the early development of commercial aircraft, including the aviation research developments, and identify the varied uses of the commercial aircraft.
b. Examine the development and use of helicopters including the personnel involved, the problems they encountered, and how the early helicopters were employed.
c. Identify governmental involvement and controls that were put in place as commercial flights were developed.

Academic Standard:
SSUSH16 The student will identify key developments in the aftermath of WW I.

PS-AFAH-9. **Students will learn the history of the Air Corps and the resultant organizations that preceded the Air Force.**

a. Create a timeline identifying the major milestones involved in the creation of the Army Air Corps and the subsequent Army Air Service.
b. Identify significant contributions the Army Air Corps/Service made to aviation and defense.
c. Compare and contrast the rationale of both the advocates and the opponents of a separate Air Force.

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PS-AFAH-10. **Students will identify the significant developments of airpower as the flying force evolved during WWII.**

a. Explain the strategic role of aircraft during WWII including the aircraft, missions, scientific advances, and personnel involved.
b. Identify the significance of airpower during D-Day and in both the European and Pacific theaters during WWII.
c. Explain how pattern bombing and combat functions evolved and changed during the war, paying attention to the reasons for these changes and the results of these changes to mankind, aircraft, and the overall status of war.
d. Describe the development of aircraft (bombers, fighters, transports) during WWII, explaining the scientific and technological advancements that were made as a result of those developments.

Academic Standard(s):

SSUSH19 The student will identify the origins, major developments, and the domestic impact of World War II, especially the growth of the federal government.

SSWH18 The student will demonstrate an understanding of the global political, economic and social impact of World War II.

North Carolina Computer Standards, p. 174. Know the role of technology in a variety of careers [aviation].

NCHS: Basic Edition, p 200. Understands President Roosevelt's ideas and policies during World War II.

NCHS: Basic Edition, p 200. Understands how World War II influenced the home front.

NCHS: World History, expanded edition, pp 253, 255, 267, 269. Understands the overall effect of World War II on various facets of society. Understands the climax and moral implications of World War II.

NCHS: U.S. History, Expanded Edition, pp. 179-180. Know that science and technology are pursued for different purposes.

Texas Technology Education/Industrial Technology Education, p. 42c11C. Know ways in which social and economic forces influence which technologies will be developed and used.

PS-AFAH-11. Students will describe the history of commercial aircraft and the key developments in aircraft and use that occurred through the years.

a. Identify key contributors to commercial flight and list contributions of each.
b. List period commercial aircraft and explain the difference from one aircraft to another.

c. Explain the various commercial airlines that operated over the years and how they evolved into the current companies.
d. Identify the pros and cons of commercial travel.
e. Describe the jet engine components and how these components make the jet engine work.

Academic Standard(s):
NCHS: Basic Edition, 66. Understands how past events are affected by the irrational and the accidental.

PS-AFAH-12. Students will identify the significance of a separate Air Force and the major defense contributions made by the Air Force during the first sixty years it existed.

a. Describe the National Security Act of 1947 and the reasoning behind this Act.
b. Identify personnel who were crucial to the development of the Air Force, including the significant Air Force leaders.
c. Create a timeline that identifies the beginning and end of the Cold War, including all the critical components of that War.
d. Explain the USAF contributions during the Berlin Airlift, the Korean War, the Vietnamese Conflict, the Cuban Missile Crisis, the Cold War, the Gulf War, Operation Enduring Freedom, and Operation Iraqi Freedom.
e. Identify aircraft, missile, and nuclear developments that occurred during this time.
f. Describe the purpose and membership in the North Atlantic Treaty Organization.

Academic Standard(s):
SSWH20 The student will examine change and continuity in the world since the 1960s.

NCHS: Basic Edition, p. 209. Understands the impact of relations between the United State and the Soviet Union during the Cold War.

NCHS: World History, expanded edition, pp. 270-272. . Understands the impact of independence movements in various countries and whether they were successful.

PS-AFAH-13. Students will understand the significance of space exploration.

a. Identify the current structure and composition of our solar system.
b. Identify the scientists who have added to our knowledge of the space system and their contributions.
c. Explain how early rocketry mad e the current space program possible.
d. Describe the beginning of the space race including the rivals, the missions, and the scientific advances of each mission.

Academic Standard(s):
SES1 Students will investigate the composition and formation of Earth systems, including the Earth's relationship to the solar system.

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NRC: National Science Education Standards, pp 175-176, 192-193, 200-201, 204. Understand that individuals and teams contribute to science and engineering at different levels of complexity.

Project 2061: Benchmarks for Science Literacy, p 8, 19, 47. Understand how scientific knowledge changes and accumulates over time.

NAEP: 1990 Science Objectives, p 26. Know that conceptual principles and knowledge guide scientific inquiries; historical and current scientific knowledge influence the design and interpretation of investigations and the evaluation of proposed explanations made by other scientists.

PS-AFAH-14. Students will identify the significant scientific and technological developments of the space race.

a. Describe rocketry developments from the Chinese to Goddard to the present and the significance of each development.
b. Explain the principles of rocketry.
c. Create a timeline to identify significant development in the US space program, including the development of NASA, the use of the space shuttle, and other significant milestones.
d. Compare and contrast expendable and reusable rockets.
e. Identify current and anticipated developments in manned air vehicles, unmanned systems, and cyber warfare.
f. Describe NASA's Orion spacecraft and Ares launch vehicle and their plans for the future.

Academic Standard(s):
TE Texas Technology Education/Industrial Technology Education, p. 44c33C; p. 44c8C. Know different requirements for structural design.

NRC: National Science Education Standards, pp 175-176, 192-193, 200-201, 204. Understands how scientific knowledge changes and accumulates over time.

Project 2061: Benchmarks for Science Literacy, p 8, 19, 47. Know that scientists conduct investigations for a variety of reasons.

NAEP: 1990 Science Objectives, p 26. Understands how scientific knowledge changes and accumulates over time.

Reading Across the Curriculum

Reading Standard Comment

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After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, research, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

a. Reading in all curriculum areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
   - Read both informational and fictional texts in a variety of genres and modes of discourse.
   - Read technical texts related to various subject areas.

b. Discussing books
   - Discuss messages and themes from nooks in all subject area.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

d. Establishing content

- Explore life experiences related to subject area content.
- Discuss in both writing and speaking how certain words are subject area related.
- Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that student pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

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CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

PROGRAM CONCENTRATION: **Government & Public Safety**
CAREER PATHWAY: **JROTC – Air Force**
COURSE TITLE: **Leadership Education I**

Air Force Junior ROTC Curriculum

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Leadership I, Citizenship, Character, and Air Force Tradition content and process skills on the AFJROTC Cybercampus have been correlated with The Project 2061's *Benchmarks for Science Literacy*, National Council for Social Studies: Curriculum Standards for Social Studies, Center for Civic Education: National Standards for Civics

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and Government, National Standards for Business Education, National Assessment of Educational Progress: National Civics Consensus Project, and Quigley's *Civitas*, A Framework for Civics Education.

Course Description:

The Leadership Education I (LE-I) textbook introduces cadets to the Air Force Junior Reserve Officer Training Corps (AFJROTC) program, providing a basis for progression through the rest of the AFJROTC program while instilling elements of good citizenship. It contains sections on cadet and Air Force organizational structure; uniform wear; customs, courtesies, and other military traditions; health and wellness; fitness; individual self-control; and citizenship.

PS-AFLEI-1. Students will explain the history of AFJROTC, the selection of commander and staff positions and describe the cadet organization.

- **a.** Define the purpose and mission of AFJROTC
- **b.** Explain the process for the selection of commanders and staff positions
- **c.** Diagram the organizational chart for the cadet organization

PS-AFLEI-2. Students will summarize the history of the military uniform, recognize Air Force and AFJROTC insignia, and explain the dress and personal appearance standards required when wearing the uniform

- **a.** Explain the origins of the military uniform
- **b.** Distinguish between the various insignia
- **c.** Describe appearance and grooming standards

PS-AFLEI-3. Students will explain historic customs and courtesies, when and how to salute and the use of correct military titles

- **a.** Describe the difference between a custom and a courtesy
- **b.** Demonstrate how to salute
- **c.** Describe when and whom to salute
- **d.** Explain the importance of military titles

PS-AFLEI-4. Students will summarize the meaning and purpose of attitude, discipline, respect and integrity in AFJROTC

- **a.** Describe the importance of a positive attitude
- **b.** Describe the importance of discipline
- **c.** Explain the role of respect and integrity
- **d.** Explain how drill helps instill discipline
- **e.**

PS-AFLEI-5. Students will explain how values and ethics are formed, how they affect both individuals and society, how to make ethical decisions and be able to recognize the USAF core values

- **a.** Describe the four basic rule of ethics and ethical traits
- **b.** Describe how to make ethical decisions
- **c.** Name the four types of values

d. Select the qualities of effective leadership

PS-AFLEI-6. Students will summarize and apply rules of etiquette and explain how to maintain appropriate personal hygiene and grooming

a. Demonstrate how to make introductions
b. Explain dining etiquette requirements
c. Explain the handling of social invitations
d. Demonstrate the writing of thank-you notes
e. Describe appropriate hygiene and grooming practices

Academic Standard(s):
ELA11W2. The student demonstrates competence in a variety of genres.

PS-AFLEI-7. Students will explain the main causes of stress and how to manage stress.

a. Distinguish between positive and negative stress
b. Explain the causes of stress
c. Predict the effects of stress on the body
d. Describe ways to manage stress

PS-AFLEI-8. Students will explain suicide risk factors and signs, and when and how to seek professional mental health care

a. Describe the types of mental and emotional problems
b. Name ways to recognize when a person is seriously depressed
c. Select the warning signs of suicide
d. Explain how to know if you need professional help for a mental or emotional problem
e. Describe the kinds of treatment available

PS-AFLEI-9. Students will recognize how to predict and prevent violence, and how to protect themselves from violence

a. Select factors that contribute to teen violence
b. Select policies to prevent violence in school
c. Describe ways to protect themselves from violence

Academic Standard(s):
SSCG21 The student will demonstrate knowledge of criminal activity.

PS-AFLEI-10. Students will explain why and how to seek preventive health care services and identify the roles of various health organizations, including government agencies.

a. Distinguish between people who provide health care services
b. Explain why teens need regular checkups
c. Distinguish between the health services provided state and local agencies
d. Explain the role and services of non-governmental health organizations

PS-AFLEI-11. Students will explain how to choose and maintain a healthful diet and use resources to make healthful dietary decisions.

a. Explain why the body needs nutritious food.
b. Predict what influences food choices
c. Explain the difference between appetite and hunger.
d. List the six types of nutrients and explain how the body uses them.
e. Select the sources of different nutrients.
f. Explain the daily need for water and fiber.
g. Explain the substances in food that should be limited.
h. Describe resources that can help you make wise food choices
i. Explain why it is important to have a balanced diet.

PS-AFLEI-12. Students will explain how to prepare for and what to do in a medical emergency.

a. Select ways to prepare for an emergency situation
b. Describe universal precautions for first-aid providers
c. Outline the basic steps to take in an emergency.
d. Explain how to recognize and evaluate common emergencies.
e. Describe first-aid treatments for common emergencies.
f. Explain when to call for medical assistance.
g. Explain how to deal with life-threatening emergencies.

PS-AFLEI-13. Students will explain the importance of physical fitness, the measures of physical fitness demonstrate how to plan and execute physical fitness plan.

a. Define physical fitness and explain the difference between physical activity and exercise.
b. Predict the benefits of physical activity.
c. Describe how to increase levels of fitness.
d. Explain heart and lung endurance and how it can be measured.
e. Describe muscle strength and endurance and how each can be measured.
f. Explain how to improve body composition.
g. Define flexibility and describe how it can be measured.
h. Explain how to set and achieve fitness goals.
i. Describe how to prepare an activity plan.
j. Label the three stages of an exercise session.
k. Explain how to check fitness progress.

PS-AFLEI-14. Students will explain how to eat healthfully, the health risks of eating disorders, and how to seek help for an eating disorder.

a. Explain the relationships between weight, growth, and health.
b. Explain how eating and physical activity habits affect weight.
c. Describe ways to maintain a healthy weight.
d. Explain why some people develop eating disorders.

e. Distinguish between anorexia nervosa, bulimia, binge eating disorders, and describe the health risks associated with each disorder.
f. Name organizations/facilities where a teen with an eating disorder can get help.

PS-AFLEI-15. Students will describe the difference between medicine and drugs. The student will be able to explain the dangers of drug abuse, how to avoid drugs, and when and how to seek help for drug-related issues.

a. Explain how medicines differ from drugs.
b. Define the various type of medicines
c. Explain how medicines affect the body.
d. Explain the difference between drug misuse and drug abuse.
e. Distinguish between the effects of narcotics, stimulants, and depressants on the body.
f. Define narcotics, stimulants, and depressants.
g. Explain the dangers of hallucinogens and the risks of using marijuana.
h. Describe how inhalants affect the body and explain the risks of using club drugs and steroids.
i. Name places where people who abuse drugs can get help.
j. Describe alternatives to using drugs.

PS-AFLEI-16. Students will describe the dangers of tobacco, how to avoid using it and how to seek help in quitting tobacco use.

a. Generate a document describing several forms of tobacco, the harmful substances in tobacco, the harmful effects of tobacco on the body, the harmful effects of secondhand smoke on nonsmokers, and negative effects that tobacco may have on appearance and the cost of tobacco on society.
b. Explain why some teens start using tobacco.
c. Select strategies for avoiding tobacco use.
d. Explain ways smokers can quit.

PS-AFLEI-17. Students will explain the dangers of alcohol, ways to avoid using alcohol, and when and how to seek help for alcohol-related issues

a. Construct a document describing the effects of alcohol on the body, the fetus, why it affects each individual differently, and the serious dangers of drinking.
b. Name the special problems alcohol causes in teens.
c. Generate a document describing the three stages of alcoholism, how alcoholics can recover, support groups that help alcohol-dependent persons and their family members, how the media influences our view of alcohol, and alternatives to alcohol for fun and relaxation.
d. Explain why teens use alcohol and ways they can refuse alcohol.

PS-AFLEI-18. Students will summarize the history and courtesies rendered to the flag of the United States and the National Anthem. They will be able to explain the

history of the Great Seal of the United States, the Air force Seal, the Pledge of Allegiance and the American's Creed.

a. Outline the history of the flag of the United States, and when and how to display the US flag.
b. Explain the courtesies rendered to the US flag.
c. List the courtesies rendered to the National Anthem.
d. Describe the:
    a. Pledge of Allegiance
    b. The American's Creed
    c. The Great Seal of the United States
    d. The Air Force Seal

Academic Standard(s):
ELAALRL1 The student demonstrates comprehension by identifying evidence (e.g., diction, imagery, point of view, figurative language, symbolism, plot events and main ideas) in a variety of texts representative of different genres (e.g., poetry, prose [short story, novel, essay, editorial, biography], and drama) and using this evidence as the basis for interpretation.

PS-AFLEI-19. Students will summarize the role and functions of government, the citizenship and naturalization process and the duties and responsibilities of citizenship.

a. Define civics
b. Explain the need for government, the functions of government, including security and public services.
c. Diagram the different levels of government and democracy
d. Distinguish between citizenship and the naturalization process.
e. Describe aliens in America.
f. Select duties and responsibilities of citizenship, including volunteerism.

Academic Standard(s):
SSCG5 The student will demonstrate knowledge of the federal system of government described in the United States Constitution.
a. Explain the relationship of state governments to the national government.
b. Define the difference between enumerated and implied powers.
c. Describe the extent to which power is shared.
d. Identify powers denied to state and national governments.
e. Analyze the ongoing debate that focuses on the balance of power between state and national governments.
f. Analyze the supremacy clause found in Article VI and the role of the U.S. Constitution as the "supreme law of the land."

SSCG6 The student will demonstrate knowledge of civil liberties and civil ***rights.***
a. Examine the Bill of Rights with emphasis on First Amendment freedoms.
b. Analyze due process law expressed in the 5th and 14th Amendments.

c. Explain selective incorporation of the Bill of Rights.
d. Explain how government seeks to maintain the balance between individual liberties and the public interest.
e. Explain every citizen's right to be treated equally under the law.

SSCG7 The student will describe how thoughtful and effective participation in civic life is characterized by obeying the law, paying taxes, serving on a jury, participating in the political process, performing public service, registering for military duty, being informed about current issues, and respecting differing opinions.

PS-AFLEI-20. Students will recognize the content of the United States Constitution and explain how it is amended and interpreted.

a. Label the parts of the Constitution and explain what they mean.
b. Describe the process of amending the Constitution.
c. Explain how the Constitution is interpreted.

Academic Standard(s):
SSCG3. The student will demonstrate knowledge of the United States Constitution.

PS-AFLEI-21. Students will recognize the content of the Bill of Rights and summarize how citizens can protect their rights and freedoms.

a. Explain the amendments in the Bill of Rights.
b. Name ways to protect our rights and freedom as American citizens.
c. Label key people who have upheld American rights and freedoms.

Academic Standard(s):
SSCG6 The student will demonstrate knowledge of civil liberties and civil rights.

SSUSH5 The student will explain specific events and key ideas that brought about the adoption and implementation of the United States Constitution.

PS-AFLEI-22. Students will recognize the structure of the three branches of government and name and summarize the duties and responsibilities of the three branches of government.

a. Describe the functions of the legislative branch of the U. S. Congress, including the House of Representatives, the Senate, and congressional leaders.
b. Construct a document outlining the qualifications for becoming president, the process of election, the presidential term of office, and the order of presidential succession.
c. Distinguish between federal, state, and district courts and their functions.
d. Explain the roles of federal judges and Supreme Court justices.

Academic Standard(s):
SSCG4. The student will demonstrate knowledge of the organization and powers of the national government.

SSCG5 The student will demonstrate knowledge of the federal system of government described in the United States Constitution.

SSCG13 The student will describe the qualifications for becoming President of the United States.

SSCG16 The student will demonstrate knowledge of the operation of the federal judiciary.

PS-AFLEI-23. Students will recognize and remember the defining characteristics of authoritarian governments, the salient features of current non-democratic governments and nations, and the characteristics of democratic governments.

a. Define authoritarian governments, including monarchies, dictatorships, and totalitarianism.
b. Describe the government of:
    a. The People's Republic of China
    b. The Republic of Iran
    c. The Republic of Iraq
    d. The Democratic People's Republic of Korea
    e. Russia
c. Describe communism in Cuba.
d. Describe the collapse of Soviet communism.
e. Describe democratic governments.
f. Explain presidential and parliamentary systems.

Academic Standard(s):
SSCG19 The student will compare and contrast governments that are unitary, conferral, and federal governments; unitary, oligarchic and democratic governments; and presidential and parliamentary governments.

SSWG5 The student will describe the interaction of physical and human systems that have shaped contemporary South Asia, Southeastern Asia, and Eastern Asia.

SSWH19 The student will demonstrate an understanding of the global social, economic and political impact of the Cold War and decolonization from 1945 to 1989.

SSWH20 The student will examine change and continuity in the world since the 1960s.

SSUSH25 The student will describe changes in national politics since 1968.

Reading Across the Curriculum

Reading Standard Comment

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, research, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

e. Reading in all curriculum areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
   - Read both informational and fictional texts in a variety of genres and modes of discourse.
   - Read technical texts related to various subject areas.

f. Discussing books
   - Discuss messages and themes from nooks in all subject area.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

g. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

h. Establishing content
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that student pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

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CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

PROGRAM CONCENTRATION: Government & Public Safety
CAREER PATHWAY: JROTC – Air Force
COURSE TITLE: Aerospace Science: Science of Flight

Air Force Junior ROTC Curriculum

The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." **McREL** Standards and Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, **McREL** is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the **National Council on Social Studies** (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the **Georgia Performance Standards** for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

All McREL Standards and Benchmarks are available for AFJROTC instructors and authorized users at https://owa.afjrotc.net/cybercampus_prod/default.aspx in the Library

under Curriculum, McRel Standards and Benchmarks. Additional national education standards are referenced in this copyrighted cybercampus information. Georgia AFJROTC instructors should reference both the Georgia and McREL standards to meet both AFJROTC and Georgia student education requirements.

Aerospace Science: The Science of Flight content and process skills on the AFJROTC Cybercampus have been correlated to National Center for History in the Schools (NCHS): U.S. History, Expanded Edition; National Council on Social Studies (NCSS): Curriculum Standards for Social Studies; *National Research Council* (*NRC*): National Science Education Standards; National Science Teachers Association (NSTA): The Content Core; Project 2061: Benchmarks for Science Literacy*; National Assessment of Educational Progress (NAEP):* NAEP: 1996 Science Framework, and Science Assessment and Exercise Specifications; Trends in International Mathematics and Science Study (TIMSS): Final Year; International Society for Technology in Education (ISTE) National Educational Technology Standards for Students; International Technology in Education Association (ITEA): Standards for Technological Literacy; AEC Australian Technology Standards; as well as educational standards from Texas, North Carolina, and California.

Course Description: Aerospace Science: The Science of Flight
The second year is a science course designed to acquaint the student with the aerospace environment, the human requirements of flight, principles of aircraft flight, and principles of navigation. The course begins with a discussion of the atmosphere and weather. After developing an understanding of the environment, how that environment affects flight is introduced. Discussions include the forces of lift, drag, thrust, and weight. Students also learn basic navigation including map reading, course plotting, and the effects of wind. The portion on the Human Requirements of Flight is a survey course on human physiology. Discussed here are the human circulatory system, the effects of acceleration and deceleration, and protective equipment. Basic concepts of aircraft flight, high school math, physics, and science are brought to life as students study *The Science of Flight.*

PS-AFSF-1. Students will demonstrate understanding of basic facts and general principles of the atmosphere.

a. Define a list of terms related to the atmosphere.
b. Describe the roles of water and particulate matter.
c. Identify the primary causes of atmospheric motion.

Academic Standard(s):
SM1. Students will relate the formation, structure and composition of Earth's atmosphere to the processes that cause weather.

SES5 Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

SES6 Students will explain how life on Earth responds to and shapes Earth systems.

PS-AFSF-2. Students will demonstrate knowledge of basic facts about the weather elements.

a. Identify types of clouds.
b. Identify types of air masses and fronts.
c. Describe terrain factors that affect weather.
d. Describe types of turbulence.
e. Identify normal weather patterns.

Academic Standard(s):
SM2. Students will investigate energy transfer to types of clouds formed, precipitation, and air masses.

SES5 Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

SES6 Students will explain how life on Earth responds to and shapes Earth systems.

SEV2 Students will demonstrate an understanding that the Earth is one interconnected system.

PS-AFSF-3. Students will demonstrate knowledge of instruments and communications used in weather forecasting.

a. Describe the instruments used for predicting weather forecasts.
b. State the role of weather satellites in predicting weather.
c. Describe the communication methods used to provide weather information.

Academic Standard(s):
SM3. Students will explore the science of weather forecasting.

SES. Students will explore the actions of water, wind, ice, and gravity that create landforms and systems of landforms (landscapes).

SES5. Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

PS-AFSF-3. Students will demonstrate an understanding of the difference between regular weather and aviation weather.

a. Explain the weather hazards associated with aviation.
b. List the types of severe weather that affect aviation.
c. Describe arctic and tropic weather characteristics.

Academic Standard(s):

SES3 Students will explore the actions of water, wind, ice, and gravity that create landforms and systems of landforms (landscapes).

SES5 Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

SM4. Students will analyze the relationship of weather and society.

PS-AFSF-4. Students will demonstrate knowledge of the physiology of flight.

a. State the layers of the atmosphere and the composition of each.
b. Describe the physiological divisions of the flight environment.
c. Define the physical laws op gases according to Boyle's Law, Dalton's Law, and Henry's Law.
d. Describe the processes for respiration and circulation.
e. State the effects of reduced pressure at altitude.
f. Define spatial disorientation and motion sickness.
g. Describe individual stresses imposed upon a pilot during flight.

Academic Standard(s):
SES1 Students will investigate the composition and formation of Earth systems, including the Earth's relationship to the solar system.

SES6 Students will explain how life on Earth responds to and shapes Earth systems.

SP4 Students will analyze the properties and applications of waves.

SP3 Students will evaluate the forms and transformations of energy.

PS-AFSF-5. Students will demonstrate an understanding of the history of aerospace medicine and human engineering.

a. Describe the early balloon flights.
b. Describe the role of a flight surgeon in taking care of a flyer's medical needs.
c. List examples of machines being adapted to man's needs for flight productivity.
d. Describe the evolving of research within the fringes of space regarding space exploration.

Academic Standard(s):
SP6 The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

SP4 Students will analyze the properties and applications of waves.

PS-AFSF-6. Students will demonstrate understanding of the protective equipment used for actual and simulated flight.

a. Describe the protective equipment used by pilots and astronauts.
b. State the purpose and function of flight simulators.

Academic Standard(s):
SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

SP3. Students will evaluate the forms and transformations of energy.

PS-AFSF-7. Students will distinguish between the principles of basic aeronautics.

a. Describe the theory of flight.
b. Describe airfoils and flight.
c. Describe the effects of relative wind.
d. Describe the effects of angle of attack.
e. Identify the four forces of flight.

Academic Standard(s):
SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

MA1G3. Students will discover, prove, and apply properties of triangles, quadrilaterals, and other polygons.

SP4. Students will analyze the properties and applications of waves.

SP3. Students will evaluate the forms and transformations of energy.

PS-AFSF-8. Students will demonstrate understanding of aircraft motion and how it is controlled.

a. Identify the axes of rotation.
b. Identify the effects of flaps on flight.
c. Identify the effect of slats on flight.
d. Identify the effects of spoilers on flight.
e. Identify the effects of drag on flight.
f. Describe the elements of controlled flight.

Academic Standard(s):
MA1A1. Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.

MA2A3. Students will analyze graphs of polynomial functions of higher degree.

MM1A3. Students will solve simple equations.

SP6 The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

SP3. Students will evaluate the forms and transformations of energy.

SP4. Students will analyze the properties and applications of waves.

PS-AFSF-9. Students will demonstrate knowledge of basic engine principles.

a. Define a list of terms related to basic engine principles.
b. Define *Boyle's Law* and *Charles and Gay-Luccas's Law*.
c. Describe how engines evolved from the earliest version to present day.
d. Describe the mechanical, cooling, and ignition system of the reciprocating engines.
e. Describe the role of reversers and suppressors used in jet aircraft.
f. Given real causes of pollution, state the method to eliminate the stated cause.

Academic Standard(s):
SEV4 Students will understand and describe availability, allocation and conservation of energy and other resources.

SC2. Students will relate how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions.

SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

MA1D1. Students will determine the number of outcomes related to a given event.

SCSh7. Students will analyze how scientific knowledge is developed.

SP3. Students will evaluate the forms and transformations of energy.

SP4. Students will analyze the properties and applications of waves.

PS-AFSF-10. Students will demonstrate knowledge of the basic facts and general operating principle of rocket engines.

a. Outline the history of rocket engines.
b. Describe how rocket engines operate.
c. List the types of rocket engines.
d. Describe advanced propulsion systems.

Academic Standard(s):

SC2. Students will relate how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions.

SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

SCSh7. Students will analyze how scientific knowledge is developed.

SP3. Students will evaluate the forms and transformations of energy.

PS-AFSF-11. Students will demonstrate knowledge of the types of civilian and military aerospace vehicles.

a. Identify the types of civilian aircraft.
b. Identify the types of military aircraft.
c. Identify the types of rockets and missiles.

Academic Standard(s):
SC2. Students will relate how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions.

SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

SCSh7. Students will analyze how scientific knowledge is developed.

SP3. Students will evaluate the forms and transformations of energy.

PS-AFSF-12. Students will use navigational aids.

a. State the elements of a map.
b. Describe how to use air navigation charts.
c. State the importance of flight planning.
d. State how to perform a preflight plan.
e. List the elements of flight.
f. State the procedures to perform when lost.

Academic Standard(s):
SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations

SCSh7. Students analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.
.
SES5. Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

PS-AFSF-13. Students will demonstrate understanding of the four elements of navigation.

a. State how the Earth's size and shape affect navigation.
b. State how to determine position.
c. State how to determine direction.
d. State how to determine distance.
e. State how to determine time.

Academic Standard(s):
SP3 Students will evaluate the forms and transformations of energy.

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations

SCSh7. Students analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

SES6. Students will explain how life on Earth responds to and shapes Earth systems.

SES5. Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

PS-AFSF-14. Students will chart projections are used in navigation.

a. Identify the problems associated with projections.
b. State the projection classifications.
c. Describe the chart projection characteristics.

Academic Standard(s):
SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SCSh7. Students analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

SES6. Students will explain how life on Earth responds to and shapes Earth systems.

SES5. Students will investigate the interaction of insulation and Earth systems to produce weather and climate.

PS-AFSF-15. Students will explain the types and functions of navigation instruments.

a. Describe the functions of the clock.
b. Describe the functions of airspeed indicators.
c. Describe the functions of the altimeter.
d. Describe the types of altitude.
e. Describe the functions of a compass.
f. Describe the functions of turn-and-slip indicators.
g. Describe the functions of attitude indicators.

Academic Standard(s):

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SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SCSh7. Students analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

PS-AFSF-16. Students will use dead reckoning techniques.

a. List basic facts and general principles of dead reckoning.
b. Describe the wind triangle and its applications.

Academic Standard(s):

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SCSh7. Students analyze how scientific knowledge is developed.

PS-AFSF-17. Students will demonstrate understanding of the types of navigational Aids.

a. Describe the uses of the ADF, VOR, TACAN VORTAC, and ILS.
b. Describe the uses of Celestial navigation.
c. Describe the uses of radar, LORAN, and Doppler.
d. Describe the uses of the Inertial Navigation System.
e. Describe the uses of the plotter.
f. Describe the uses of the dead reckoning computer.

Academic Standard(s)

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SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

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SCSh7. Students analyze how scientific knowledge is developed.

Co-Requisite – Characteristics of Science

Habits of Mind

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

a. Exhibit the above traits in their own scientific activities.
b. Recognize that different explanations often can be given for the same evidence.
c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

a. Follow correct procedures for use of scientific apparatus.
b. Demonstrate appropriate technique in all laboratory situations.
c. Follow correct protocol for identifying and reporting safety problems and violations.

SCSh3. Students will identify and investigate problems scientifically.

a. Suggest reasonable hypotheses for identified problems.
b. Develop procedures for solving scientific problems.
c. Collect, organize and record appropriate data.
d. Graphically compare and analyze data points and/or summary statistics.
e. Develop reasonable conclusions based on data collected.
f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

a. Develop and use systematic procedures for recording and organizing information.
b. Use technology to produce tables and graphs.
c. Use technology to develop, test, and revise experimental or mathematical models.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

a. Trace the source on any large disparity between estimated and calculated answers to problems.
b. Consider possible effects of measurement errors on calculations.
c. Recognize the relationship between accuracy and precision.
d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.
e. Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.

SCSh6. Students will communicate scientific investigations and information clearly.

a. Write clear, coherent laboratory reports related to scientific investigations.
b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.
c. Use data as evidence to support scientific arguments and claims in written or oral presentations.
d. Participate in group discussions of scientific investigation and current scientific issues.

The Nature of Science

SCSh7. Students analyze how scientific knowledge is developed.

Students recognize that:

a. The universe is a vast single system in which the basic principles are the same everywhere.
b. Universal principles are discovered through observation and experimental verification.
c. From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically

occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.

d. Hypotheses often cause scientists to develop new experiments that produce additional data.
e. Testing, revising, and occasionally rejecting new and old theories never ends.

SCSh8. Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:

a. Scientific investigators control the conditions of their experiments in order to produce valuable data.
b. Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.
c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.
d. The merit of a new theory is judged by how well scientific data are explained by the new theory.
e. The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.
f. Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.

Reading Across the Curriculum

After the elementary years, students are seriously engaged in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary; and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context. Beginning in the middle grades, students start to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

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Students will enhance reading in all curriculum areas by:

a. Reading in all curriculum areas
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b. Discussing books
    - Discuss messages and themes from books in all subject areas.
    - Respond to a variety of texts in multiple modes of discourse.
    - Relate messages and themes from one subject area to messages and themes in another area.
    - Evaluate the merit of texts in every subject discipline.
    - Examine author's purpose in writing.
    - Recognize the features of disciplinary texts.

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CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

Social Studies Skills Matrices

MAP AND GLOBE SKILLS GOAL:

The student will use maps to retrieve social studies information. I: indicates when a skill is introduced in the standards and elements as part of the content D: indicates grade levels where the teacher must develop that skill using the appropriate content M: indicates grade level by which student should achieve mastery, the ability to use the skill in all situations A: indicates grade levels where students will continue to apply and improve mastered skills.

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Map and Globe Skills	K	1	2	3	4	5	6	7	8	9-12
1. Use cardinal directions	I	M	A	A	A	A	A	A	A	A
2. Use intermediate directions		I	M	A	A	A	A	A	A	A
3. Use a letter/number grid system to determine location			I	M	A	A	A	A	A	A
4. Compare and contrast the categories of natural, cultural, and political features found on maps			I	M	A	A	A	A	A	A
5. Use inch to inch map scale to determine distance on maps			I	M	A	A	A	A	A	A
6. Use map key/legend to acquire information from historical, physical, political, resource, product, and economic maps			I	D	M	A	A	A	A	A
7. Use map to explain impact of geography on historical and political events			I	D	M	A	A	A	A	A
8. Draw conclusions and make generalizations based on maps				I	M	A	A	A	A	A
9. Use latitude and longitude to determine location				I	D	D	D	M	A	A
10. Use graphic scales to determine distances on maps					I	M	A	A	A	A
11, Compare maps of the same place at different points in time and from different perspectives to determine changes, identify trends, and generalize about human activities					I	M	A	A	A	A

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INFORMATION PROCESSING SKILLS

GOAL: The student will be able to locate, analyze, and synthesize information related to social studies topics and apply this information to solve problems/make decisions.
I: indicates when a skill is introduced in the standards and elements as part of the content
D: indicates grade levels where the teacher must develop that skill using the appropriate content
M: indicates grade level by which student should achieve mastery, the ability to use the skill in all situations
A: indicates grade levels where students will continue to apply and improve mastered skills

Information Processing Skills	K	1	2	3	4	5	6	7	8	9-12
1. Compare similarities and differences	I	D	M	A	A	A	A	A	A	A
2. Organize items chronologically	I	D	D	M	A	A	A	A	A	A
3. Identify issues and/or problems and alternative solutions	I	D	D	D	D	M	A	A	A	A
4. Distinguish between fact and opinion		I	D	M	A	A	A	A	A	A
5. Identify main idea, detail, sequence of events, and cause and effect in a social studies context		I	D	D	M	A	A	A	A	A
6. Identify and use primary and secondary sources		I	D	D	M	A	A	A	A	A
7. Interpret timelines		I	D	D	M	A	A	A	A	A
8. Identify social studies reference resources for a specific purpose			I	M	A	A	A	A	A	A
9. Construct charts and tables			I	M	A	A	A	A	A	A
10. Analyze artifacts			I	D	D	M	A	A	A	A
11. Draw conclusions and make generalizations				I	M	A	A	A	A	A
12. Analyze graphs and diagrams				I	D	M	A	A	A	A
13. Translate dates into centuries, eras, or ages				I	D	M	A	A	A	A
14. Formulate appropriate research questions					I	M	A	A	A	A
15. Determine adequacy and/or relevancy of information					I	M	A	A	A	A
16. Check for consistency of information					I	M	A	A	A	A
17. Interpret political cartoons					I	D	D	D	M	A

PROGRAM CONCENTRATION: Government & Public Safety

Implementation date DRAFT
Fall 2010
CAREER PATHWAY: JROTC – Air Force
COURSE TITLE: Leadership Education II

Air Force Junior ROTC Curriculum

The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." McREL Standards and Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, McREL is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the National Council on Social Studies (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the Georgia Performance Standards for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

All McREL Standards and Benchmarks are available for AFJROTC instructors and authorized users at https://owa.afjrotc.net/cybercampus_prod/default.aspx in the Library under Curriculum, McRel Standards and Benchmarks. Additional national education standards are referenced in this copyrighted Cybercampus information. Georgia AFJROTC instructors should reference both the Georgia and McREL standards to meet both AFJROTC and Georgia student education requirements.

Leadership Education II, *Communication, Awareness, and Leadership* content and process skills on the AFJROTC Cybercampus have been correlated to McRel standards for Thinking and Reasoning, Working With Others, Language Arts, Life Work, Arts and Communication, Civics, Historical Understanding, Health and Technology, Self-Regulation, Behavioral Studies, United States History, and Health.

Course Description:

Leadership Education II: Communication, Awareness, and Leadership focuses on the Air Force Junior Reserve Officer Training Corp (AFJROTC) mission to "develop citizens of character dedicated to serving their nation and community." This is accomplished through better communication, increased awareness of self and others, and improved leadership. Woven throughout the course is the underlying theme of developing personal integrity while emphasizing leadership and other values, such as service and excellence.

PS-AFLEII-1. Students will identify the parts of the communication process and explain how the process works. Explain and summarize encoding and decoding, verbal and nonverbal communication cues, the importance of feedback, and barriers to effective communication.

a. Diagram the communication process.
b. Describe encoding and decoding.
c. Select and list communication cues
d. Name and give examples of three barriers to effective communication
e. Explain the importance of feedback

PS-AFLEII-2. Students will recognize and explain the difference between listening and hearing, the types of listening, and the importance of listening.

a. Distinguish the difference between listening and hearing.
b. Select the three types of listening and give examples of each.
c. Describe one of the three types of listening.
d. Demonstrate examples of problems resulting from poor listening.

PS-AFLEII-3. Students will identify the component parts of the thinking process, recognize the standards of critical thinking, and explain the importance of learning to think and how to ask good questions.

a. Diagram the thinking process
b. Distinguish between thinking and reflection.
c. Describe the impact of thinking on decision making and on problem solving.
d. Name and evaluate three standards for critical thinking.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-4. Students will identify the six steps in the basic checklist for communication and organizational patterns.

a. Diagram the six steps in the basic checklist.
b. Explain purpose and audience.
c. Compare and contrast various ways of conducting research.
d. Show how to support ideas
e. Justify the benefits of getting organized.
f. Select the six organizational patterns.
g. Describe the benefits of writing a draft.
h. Describe the benefits of feedback.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

ELA11W2. The student demonstrates competence in a variety of genres.

PS-AFLEII-5. Students will recognize the elements of effective writing, and active voice in writing. They will summarize the three-part structure of a draft paper, the rules for the use of personal pronouns, the rules of subject-verb agreement, and the basics of e-mail protocol. The students will apply the elements of effective writing.

a. Describe tone, clarity, and continuity.
b. Distinguish between the three parts of a paper.
c. Describe ways to structure paragraphs and write transitions.
d. Label a topic sentence, sentences written in active and passive voice, and sentences with appropriate subject-verb agreement.
e. Describe style and substance guidelines.
f. Label the six rules of e-mail protocol.
g. Construct a letter or article using the effective writing style.

Academic Standard(s):
ELA11W1. The student produces writing that establishes an appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals a satisfying closure. The student

MA3P1. Students will solve problems (using appropriate technology).

ELA11W2. The student demonstrates competence in a variety of genres.

PS-AFLEII-6. Students will summarize the steps for preparing to speak, for organizing a presentation, and the techniques for presenting a talk. They will apply the elements of effective speaking.

a. Distinguish between the six steps for effective communication.
b. Explain the importance of knowing the situation and audience.
c. Diagram the three types of speaking and the three purposes of a speech.
d. Distinguish between the four common methods of presentation.
e. Outline a presentation and include an introduction, body, conclusion, transitions, and illustrations.
f. Explain presentation skills and the importance of practicing your speech.
g. Present a speech using the effective speaking format.

Academic Standard(s):
ELA9LSV2 The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.

ELA10LSV2 The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid

reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.

PS-AFLEII-7. Students will apply the rules associated with Maslow's hierarchy of needs and recognize the elements of attitude and how goals influence actions.

a. Diagram the five levels of human needs.
b. Describe how different needs motivate behavior.
c. Describe a belief (perspective, outlook on life) many people have about the world.
d. Explain the value of a positive attitude.
e. Describe a desire that is common among students.
f. Explain an event in which goals led to actions.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-8. Students will predict the ways that attitudes affect actions, remember and name the common defense mechanisms, the key elements of a positive attitude, and the priority of task completion and people.

a. Define attitude.
b. Select defense mechanisms from a list.
c. Explain actions that demonstrate positive and negative attitudes.
d. Select task completion and people as priorities from a list of options.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-9. Students will recognize the qualities of perseverance, courage, and patience in a leader.

a. Explain the definition of a leader.
b. Define perseverance, courage, and patience.
c. Describe actions associated with perseverance, courage, and patience.
d. In a story that illustrates leadership, identify examples of perseverance, courage, and patience.

PS-AFLEII-10. Students will recognize integrity in good citizens, explain what it means to be a positive role model and the impact of character on behavior.

a. Define integrity.
b. Label personal standards of conduct that reflect excellence.
c. Describe the actions of personal role models and actions that demonstrate loyalty.
d. Select examples of integrity in action in citizens.
e. Describe how actions speak louder than words.
f. Explain the way in which character influences action and the relationship between commitment and responsibility.

PS-AFLEII-11. Students will explain the eight basic elements of personality types described in the Myers-Briggs Type Indicator® (MBTI)® and the ways in which personality influences actions and the strengths and weaknesses of different personality types and styles.

a. Define personality.
b. Devise four questions to ask about personality preferences.
c. Distinguish between characteristics of extraversion, introversion, sensing, intuition, thinking, feeling, judging, and perceiving.
d. Describe the ways in which extraverts and introverts are energized to act.
e. Select your personality type.
f. Describe the strengths and weaknesses of your personality type.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-12. Students will explain the consequences of taking or avoiding responsibility and the consequences of actions and decisions. The student will explain common ways in which people use defense mechanisms to avoid responsibility.

a. Define consequences.
b. Select the advantages of personal accountability.
c. Describe the effects of defense mechanisms.
d. Label examples of denial.
e. Give examples of shifting blame.
f. Describe patterns of rationalism and the effects of acting without thinking.
g. Predict the possible consequences of making bad decisions.
h. Explain some of the possible results of failing to think and act carefully when solving a problem.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-13. Students will work as a team while explaining the characteristics of effective teams. They will explain the four stages of team development and how to plan for and run an effective meeting.

a. Describe the purpose of team goals.
b. Explain the importance of team roles.
c. Select three common concerns of team members.
d. Describe the advantages of defined goals
e. Describe the assignment of clear roles.
f. Select examples of team rules.
g. Explain the need for clear and constructive communication.
h. Describe the benefits of balanced participation.
i. Diagram the four stages of team growth.

j. Describe the feelings and behaviors associated with the four stages of team growth.
k. Explain some important points to consider in planning and running meetings.

PS-AFLEII-14. Students will explain the dimensions of respect, the values of tolerance and understanding, and how to improve group effectiveness.

a. Define mutual respect, personal dignity, prejudice, discrimination, and stereotyping.
b. Describe ways to demonstrate mutual respect, and ways to work toward common goals.
c. Distinguish between how people show tolerance and understanding toward one another.
d. Explain reasons for prejudice, discrimination, and gender stereotypes.
e. Explain the benefits of accepting differences
f. Name ways to evaluate and measure group effectiveness.

PS-AFLEII-15. Students will identify the elements of a common vision, write a team charter, and explain how to enlist others to work toward a common vision.

a. Define vision and excellence.
b. Explain how to write a team vision statement.
c. Describe how to write tam goals and actions that encourage team members to work together.
d. Name different types of team assignments.
e. Diagram a timeline for achieving results.

PS-AFLEII-16. Students will explain about solving problems and conflicts and the patterns of reacting to conflict. Students will summarize the types of problems in groups and the levels of conflict in groups.

a. Define problem and conflict.
b. Name several types of problems with relations.
c. Describe problems with direction.
d. Explain operational problems.
e. Diagram levels of conflict in groups.
f. Describe the patterns of reacting to conflict.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-17. Students will explain common group problems, common indicators of group problems, and the six steps of problem solving.

a. Name the types of groups that have problems.
b. Define poor performance.
c. Explain the common signs of troubled relationships.
d. Explain the effects of low morale.
e. Distinguish between the six steps of problem solving.

f. Diagram ways to list and test possible solutions.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-18. Students will recognize, remember and explain the nature of consensus and methods of building consensus.

a. Define consensus and a unilateral decision.
b. Describe the benefits of consensus and active listening.
c. Explain the importance of negotiation and compromise.
d. Name the characteristics of good questions.

Academic Standard(s):
MA3P1. Students will solve problems (using appropriate technology).

PS-AFLEII-19. Students will recognize and explain the basic elements of leadership, the Air Force Core Values, and reasons for recognizing the Core Values.

a. Define leadership and name the two basic elements of leadership.
b. Explain the three Air Force Core values.
c. Define integrity and name three moral traits associated with integrity.
d. Describe four behaviors that reflect the Core Values of service before self.
e. Define excellence.
f. Name five areas of excellence in performance.
g. Describe four reasons for recognizing the Core Values.

PS-AFLEII-20. Students will recognize and explain the traits of effective leaders, the importance of competence and commitment in a leader.

a. Name six leadership traits.
b. Describe the six leadership traits.
c. Define competence and commitment.
d. Name two key components of competence in an effective leader.
e. Distinguish between indicators of strong commitment.

PS-AFLEII-21. Students will summarize the key principles of leadership, the importance of setting the example, of caring for your people, and of accepting responsibility.

a. Define leadership principles, setting the example, and caring for your people.
b. Explain a situation in which a leader set the example for his or her followers, and demonstrates caring for his or her people.
c. Explain the primary responsibility of a leader.
d. Predict the effects on a team when a leader fails to accept responsibility.

PS-AFLEII-22. Students will explain two orientations to leadership behavior and summarize the four leadership styles and the primary factors of the leadership situation.

a. Distinguish between orientation toward people and tasks.
b. Label the components of the leadership grid.
c. Explain the following leadership styles:
    a. Telling
    b. Selling
    c. Participating
    d. Delegating
d. Explain environmental factors.

PS-AFLEII-23. Students will recognize the readiness factors of followers and effective ways to relate to leaders.

a. Define followership.
b. Describe:
    a. The willingness of followers.
    b. The ability of followers.
    c. The confidence of followers.
c. Name three actions to take in supporting leaders.

PS-AFLEII-24. Students will explain ways to prepare for leadership, the key elements of effective coaching and mentoring, and apply ways to practice leadership.

a. Explain four actions to take in preparing to lead.
b. Explain questions to ask in observing a leader.
c. Explain coaching.
d. Explain ways to build trust and opportunities to lead.
e. Organize and execute a team project.
f. Demonstrate ways to evaluate your experience.

Reading Across the Curriculum

Reading Standard Comment

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those

subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, research, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

i. Reading in all curriculum areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
   - Read both informational and fictional texts in a variety of genres and modes of discourse.
   - Read technical texts related to various subject areas.

j. Discussing books
   - Discuss messages and themes from nooks in all subject area.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

k. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

l. Establishing content
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that student pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these

skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

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CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

PROGRAM CONCENTRATION: Government & Public Safety
CAREER PATHWAY: JROTC – Air Force
COURSE TITLE: Aerospace Science: Astronomy

Air Force Junior ROTC Curriculum
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Course Description:
Explorations: An Introduction to Astronomy guides students through the history of astronomy starting with the Chinese and ending with today's scientific discoveries. Students learn about the scientific reasons for the composition of celestial objects in the Milky Way using the laws of physics. They review the discoveries various astronomers

and scientists have made, concluding with recent efforts to learn more about objects in our universe. Basic concepts of space, high school math, and science are brought to life as students study this introduction to astronomy.

PS-AFA-1. Students will explain the scientific view of the origin of the universe, the evolution of scientific view of the universe, the identification of celestial objects, and individuals who contributed to historic and current knowledge of astronomy.

a. Outline the main arguments and evidence in support of the standard cosmological model. (e.g. elements, solar systems, and universe)
b. Compare and contrast the major properties of the components of our solar system.
c. Describe the cyclical motions people saw through the ages and how they used that motion to form opinions about the universe.

d. Evaluate the contributions early astronomers made to our understanding of space and the solar system.
e. Identify celestial objects that are visible in the night sky and use those objects to explain how we measure distances and the location of celestial bodies.

Academic Standard(s):
SAST2. Students will describe the scientific view of the origin of the universe, the evolution of matter, and the development of resulting celestial objects.

SAST4. Students will analyze the dynamic nature of astronomy by comparing and contrasting evidence supporting current views of the universe with historical views.

PS-AFA-2. Students will explain the composition of Earth including the size, density, atmosphere, and magnetic field.

a. Explain the scientific principles that interact to create the Earth's shape.
b. Identify materials that compose Earth, determine their density, and use that information to explain the overall weight of Earth.
c. Describe the various actions associated with earthquakes and how each of these actions affects the Earth's surface.
d. Evaluate the overall location, structure and purpose of Earth's magnetic field.

Academic Standard(s):
SAST1. Students will explain the tools used by astronomers to study electromagnetic radiation to determine composition, motions, and other physical attributes of astronomical objects.

PS-AFA-3. Students will describe and explain the composition of the Moon including the size, density, atmosphere, and magnetic field.

a. Explain the scientific principles and celestial activity that creates the Moon's surface and shape.
b. Describe the orbital phases of the Moon and the effect those orbits have on Earth.

c. Evaluate the contributions early mankind made to our understanding of the moon and explain how early beliefs have changed with advances in scientific knowledge about the Moon.

Academic Standard(s):
SAST3. Students will describe and explain the celestial sphere and astronomical observations made from the point of reference of the Earth.

PS-AFA-4. Students will describe and explain the solar system including both main and minor players.

a. Evaluate the importance of the Sun to the existence of Earth, highlighting both the negative and positive benefits Earth receives from the Sun.
b. Compare and contrast the scientific theories concerning the origin of the solar system.
c. Diagram the evolution of solar nebula into the solar system.

d. Describe recent scientific findings including planets, celestial objects, and other universes and explain how these discoveries might affect life on Earth in the future.

Academic Standard(s):
SAST5: Students will evaluate the significance of energy transfers and energy transformations in understanding the universe.

PS-AFA-5. Students will evaluate the significance of the composition, location, and orbits of the terrestrial planets and Jovian planets.

a. Compare and contrast the atmosphere, rotation, and planetary construction (interior and exterior) of the terrestrial planets.
b. Explain the greenhouse effect and how it affects various life forms.
c. Describe current and planned missions to Mars, including the justification for making these journeys and the hazards involved.
d. Compare and contrast the atmosphere, rotation, and planetary construction (interior and exterior) of the Jovian planets.
e. Diagram the orbits, moons, and rings of the Jovian planets.
f. Describe current and planned missions to the Jovian planets, including the justification for these missions and the hazards involved.

Academic Standard(s):
SAST5: Students will evaluate the significance of energy transfers and energy transformations in understanding the universe.

Co-Requisite – Characteristics of Science

Habits of Mind

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

a. Follow correct procedures for use of scientific apparatus.

b. Demonstrate appropriate technique in all laboratory situations.

c. Follow correct protocol for identifying and reporting safety problems and violations.

SCSh3. Students will identify and investigate problems scientifically.

a. Suggest reasonable hypotheses for identified problems.

b. Develop procedures for solving scientific problems.

c. Collect, organize and record appropriate data.

d. Graphically compare and analyze data points and/or summary statistics.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

a. Develop and use systematic procedures for recording and organizing information.

b. Use technology to produce tables and graphs.

c. Use technology to develop, test, and revise experimental or mathematical models.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

a. Trace the source on any large disparity between estimated and calculated answers to problems.

b. Consider possible effects of measurement errors on calculations.

c. Recognize the relationship between accuracy and precision.

d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.

e. Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.

SCSh6. Students will communicate scientific investigations and information clearly.

a. Write clear, coherent laboratory reports related to scientific investigations.

b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.

c. Use data as evidence to support scientific arguments and claims in written or oral presentations.

d. Participate in group discussions of scientific investigation and current scientific issues.

The Nature of Science

SCSh7. Students analyze how scientific knowledge is developed.

Students recognize that:

a. The universe is a vast single system in which the basic principles are the same everywhere.

b. Universal principles are discovered through observation and experimental verification.

c. From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.

d. Hypotheses often cause scientists to develop new experiments that produce additional data.

e. Testing, revising, and occasionally rejecting new and old theories never ends.

SCSh8. Students will understand important features of the process of scientific inquiry.
Students will apply the following to inquiry learning practices:

a. Scientific investigators control the conditions of their experiments in order to produce valuable data.

b. Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.

c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.

d. The merit of a new theory is judged by how well scientific data are explained by the new theory.

e. The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.

f. Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.

Reading Across the Curriculum

Reading Standard Comment
After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, research, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

m. Reading in all curriculum areas
- Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
- Read both informational and fictional texts in a variety of genres and modes of discourse.
- Read technical texts related to various subject areas.

n. Discussing books
- Discuss messages and themes from nooks in all subject area.
- Respond to a variety of texts in multiple modes of discourse.
- Relate messages and themes from one subject area to messages and themes in another area.
- Evaluate the merit of texts in every subject discipline.
- Examine author's purpose in writing.
- Recognize the features of disciplinary texts.

o. Building vocabulary knowledge
- Demonstrate an understanding of contextual vocabulary in various subjects.
- Use content vocabulary in writing and speaking.
- Explore understanding of new words found in subject area texts.

p. Establishing content
- Explore life experiences related to subject area content.
- Discuss in both writing and speaking how certain words are subject area related.
- Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that student pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and

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Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

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PROGRAM CONCENTRATION: Government & Public Safety
CAREER PATHWAY: JROTC – Air Force
COURSE TITLE: Leadership Education III

Air Force Junior ROTC Curriculum
The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." **McREL** Standards and Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, **McREL** is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the **National Council on Social Studies** (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the **Georgia Performance Standards** for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

All McREL Standards and Benchmarks are available for AFJROTC instructors and authorized users at https://owa.afjrotc.net/cybercampus_prod/default.aspx in the Library under Curriculum, McRel Standards and Benchmarks. Additional national education standards are referenced in this copyrighted cybercampus information. Georgia AFJROTC instructors should reference both the Georgia and McREL standards to meet both AFJROTC and Georgia student education requirements.

Leadership III, Life Skills and Career Opportunities content and process skills on the AFJROTC Cybercampus have been correlated to McRel standards for Thinking and Reasoning, Working With Others, Language Arts, Life Work, Arts and Communication, Civics, Self-Regulation, Behavioral Studies, Health, Mathematics, and Economics.

Course Description:
Leadership Education II: Life Skills and Career Opportunities focuses on the AFJROTC mission to "develop citizens of character dedicated to serving their nation and community" by providing life skills training students will need. The curriculum covers educational and career opportunities, concepts for building wealth, college applications and course study, as well as the job-search process. The skills and knowledge students learn should make them happier, more productive citizens.

PS-AFLEIII-1. **Students will examine the multiple career paths that are available and identify key aspects they should consider when choosing a career path.**

a. Research several career paths and identify steps required to attain those careers.
b. Identify resources available for career planning.
c. List key factors to consider when choosing a career path.
d. Research career options in the military and the steps required to enter both the enlisted and the officer corps.
e. Identify the types of career opportunities available in the aerospace industry and the major agencies in the aerospace industry.
f. Describe the work of one career in the civilian workforce, military workforce, and aerospace workforce.
g. List four major subjects to study in preparing for a career in the civilian workforce, military workforce, and aerospace workforce.

Academic Standard(s):
ELA9W2. The student produces technical writing that reports technical information and/or conveys ideas clearly, logically, and purposefully to a particular audience.

ELA9W3, ELA10W3, ELA11W3, ELA12W3. The student uses research and technology to support writing.

PS-AFLEIII-2. **Students will examine the multiple educational and career paths that are available to them along with the aptitude requirements in those career paths.**

a. Identify the 16 personality types and methods used to identify those personality types.
b. Match the types of civilian, military, and aerospace jobs with work style preferences.
c. List the advantages and disadvantages of a technically oriented career path.
d. Compare and contrast technical training programs, apprenticeship programs, and intern programs.
e. Outline the advantages of pursuing a higher education and the job classifications associated with educational tracks.
f. Identify the earning potential for different types of education-based careers.

Academic Standard(s):
SSEMI4 The student will explain the organization and role of business, and analyze the four types of market structures in the U.S. economy.

ELA9RL, ELA10RL1 The student demonstrates comprehension by identifying evidence (e.g., diction, imagery, point of view, figurative language, symbolism, plot events and main ideas) in a variety of texts representative of different genres (e.g., poetry, prose

[short story, novel, essay, editorial, biography], and drama) and using this evidence as the basis for interpretation.

ELA9LSV2, ELA10LSV2 The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.

ELA9W2, ELA10W2 The student demonstrates competence in a variety of genres.

PS-AFLEIII-3. Students will learn to create financial plans for their future that include budgeting, savings and bank accounts, and purchasing power.

a. Identify the components of a personal financial plan and the steps followed to develop a financial plan.
b. Name sources of income and spending requirements.
c. Explain the various bank services and procedures required for each service.
d. Demonstrate balancing a checking account.
e. Identify advantages and disadvantages of credit and debit cards.
f. Compare and contrast checking and savings accounts.
g. Identify buying and selling issues that occur daily.
h. List the issues that must be considered when buying or leasing apartments/homes.
i. Outline the issues to consider in buying or leasing cars
j. Explain the factors and issues to consider in determining a monthly budge.

Academic Standard(s):
SSEPF5 The student will describe how insurance and other risk-management strategies protect against financial loss.

SSEF4 The student will compare and contrast different economic systems, and explain how they answer the three basic economic questions of what to produce, how to produce and for whom to produce.

SSEPF1 The student will apply rational decision to the making of personal spending and savings choices.

SSEPF2 The student will explain that banks and other financial institutions are businesses which channel funds from savers to investors.

PS-AFLEI-4. Students will learn how to manage their finances and various problem areas.

a. List the positive and negative aspects of using credit.

b. Describe differing credit and credit card options along with the positive and negative aspects of both.
c. State the costs associated with attending a community, two-year, or four-year college
d. List possible sources of funds for financing a college education
e. Describe the major types of insurance available to protect personal resources
f. Explain the activities that constitute identity theft and describe actions that could prevent identity theft.

Academic Standard(s):
SSEPF1 The student will apply rational decision to the making of personal spending and savings choices.

SSEPF5 The student will describe how insurance and other risk-management strategies protect against financial loss.

SSEF4 The student will compare and contrast different economic systems, and explain how they answer the three basic economic questions of what to produce, how to produce and for whom to produce.

SSEPF2 The student will explain that banks and other financial institutions are businesses which channel funds from savers to investors.

SSEMA3 The student will explain how the government uses fiscal policy to promote price stability, full employment and economic growth.

PS-AFLEIII-5. **Students will identify steps necessary for being accepted to and entering college.**
a. Describe the various methods of college entrance testing and possible test questions that will go with each test.
b. Explain the college applications process including entrance essays, interviews, and campus visits.

Academic Standard(s):
ELA9LSV2 *d* ***, ELA10LSV2*** *d* ***, ELA11LSV2*** *d* ***, ELA12LSV2*** *d. Applies appropriate interviewing techniques (e.g., demonstrates knowledge of the subject and organization, compiles and reports responses, evaluates the effectiveness of the interview).*

ELA9W3, ELA19W3, ELA11W3, ELA12W3. The student uses research and technology to support writing.

ELAALRL4 The student employs a variety of writing genres to demonstrate a comprehensive grasp of significant ideas in selected literary works. The student composes essays, narratives, poems, or technical documents.

ELA10W3, ELA11W3, ELA12W3. The student uses research and technology to support writing.

ELA10W2, ELA11W2, ELA12W2. The student demonstrates competence in a variety of genres.

PS-AFLEIII-6. Students will identify aspects of campus life that are different from high school. They will learn how to manage their time and make healthy life choices in their academic and personal lives.

a. Identify aspects of campus life that are different from high school, including campus organizations, extracurricular activities, living arrangements, and campus resources.
b. Compare and contrast college and high school academic policies.
c. Explain the points that need to be considered to make healthy lifestyle choices in order to maintain your physical and mental health.
d. List signs of burnout, depression, stress, and anxiety.
e. Examine the different areas of college study and the different careers associated with specific majors.
f. List personal interests and desires and explain how they affect the decision-making process when selecting a major.
g. Outline the importance of time management in both your academic and personal life.

Academic Standard(s):
SSEPF1 The student will apply rational decision to the making of personal spending and savings choices.

SSEF2 The student will give examples of how rational decision making entails comparing the marginal benefits and the marginal costs of an action.

ELA10LSV1, ELA11LSV1, ELA12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

SEV4 Students will understand and describe availability, allocation and conservation of energy and other resources.

PS-AFLEIII-7. Students will identify steps in the job search and interview process.

a. List personal job skills and methods to help sell your skills to a potential employer.
b. Explain how to organize and prepare for a job search.
c. Prepare a personal résumé.
d. Outline the interview process.
e. Explain qualities employers use in evaluation including character, commitment, and competence.

f. Complete a practice interview.

Academic Standard(s):
ELA9LSV2 *d* ***, ELA10LSV2*** *d* ***, ELA11LSV2*** *d* ***, ELA12LSV2*** *d. Applies appropriate interviewing techniques (e.g., demonstrates knowledge of the subject and organization, compiles and reports responses, evaluates the effectiveness of the interview).*

PS-AFLEIII-8. **Students will develop career skills including planning professional development, learning teamwork, and dealing with feedback.**

a. Explain how to plan for professional development.
b. Compare and contract personal and organizational values.
c. Describe the dimensions of communication.
d. Give examples of the dimensions of collaboration.
e. Demonstrate how to seek and receive feedback.
f. Outline effective and appropriate ways to seek promotions.

Academic Standard(s):
ELA9LSV2, ELA10LSV2, ELA11LSV2, ELA12LSV2. The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.

MA1P3, MA2P3, MA3P3, MM1P3, MM2P3, MM3P3, MM4P3. Students will communicate mathematically.

Reading Across the Curriculum

Reading Standard Comment
After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

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q. Reading in all curriculum areas
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   - Read both informational and fictional texts in a variety of genres and modes of discourse.
   - Read technical texts related to various subject areas.

r. Discussing books
   - Discuss messages and themes from nooks in all subject area.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

s. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

t. Establishing content
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

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CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

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CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

PROGRAM CONCENTRATION: Government & Public Safety
CAREER PATHWAY: JROTC – Air Force
COURSE TITLE: Aerospace Science: Exploration of Space

Air Force Junior ROTC Curriculum

The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." **McREL** Standards and Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, **McREL** is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the **National Council on Social Studies** (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the **Georgia Performance Standards** for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

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Exploration of Space content and process skills on the AFJROTC Cybercampus have been correlated with National Science Standards for Grades 9 – 12, National Association of Teachers of Mathematics Standards, Colorado State Science Standards For Grades 9 – 12 and Colorado Math Standards.

Course Description:

Implementation date DRAFT
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Aerospace Science: The Exploration of Space guides students through an all new world of satellites, orbits, space environments and travel to other planets. Students gain great insights into how and why we go to so much trouble to put complicated satellites into orbit. The discoveries and sacrifices of many space pioneers are highlighted in this course. Basic concepts of space flight, high school math, physics, and science are brought to life as students study space exploration.

PS-AFES-1. Students will know the advantages offered by space and its unique environment. Students will know the elements common to all space missions and how they work together for success

a. Explain unique characteristics of space.
b. Describe current missions.
c. Identify the elements that make up a space mission.
d. Illustrate how various mission elements work together.

Academic Standard(s):

SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

NSS E.2. All students should develop understandings about science and technology.

NSS F.6. All students should develop an understanding of science and technology in local, national, and global challenges

NSS G.1. All students should develop an understanding of science as a human endeavor.

PS-AFES-2. Students will know the rapid changes in space exploration in the 20th century from the first crude rockets to space shuttles. They will know scientific and commercial space achievements and key events in the creation of Air Force Space Command.

a. Identify major events that have led to our ability to explore space.
b. Describe current trends in the exploration of space.
c. Identify recent scientific and commercial achievements in space explorations.
d. Diagram key events in the creation of Air Force Space Command.

Academic Standard(s):

SP6 The student will describe the connections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

NSS D.1. Students should develop an understanding of the origin and evolution of the universe.

NSS E.2. Students should develop understandings about science and technology.

NSS 6.C. Students should develop an understanding of science and technology in local, national, and global challenges.

NSS G.1. Students should develop an understanding of science as a human endeavor.

NSS G.2. Students should develop an understanding of the nature of scientific knowledge.

NSS G.3. Students should develop an understanding of historical perspectives.

PS-AFES-3. Students will know where space is and Earth's place in the universe. Students will know the major hazards of the space environment and their effect on spacecraft and mankind

a. Explain where space begins and how it's defined based on its beginning.
b. Diagram Earth's place in the universe in relationship with major celestial objects.
c. Describe major hazards of the space environment including their effect on spacecraft.
d. Compare and contrast the three effects free-fall environments have on the human body.
e. Describe the major hazards of the space environment that pose a problem for humans living and working in space.

Academic Standard(s):
SPS3. Students will distinguish the characteristics and components of radioactivity.

S7. Students will relate transformations and flow of energy within a system.

NATM. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NATM. Understand measurable attributes of objects and the units, systems, and processes of measurements.

NATM. Recognize and apply mathematics outside of mathematics.

NSS E.2. Students should develop understandings about science and technology.

NSS 6.C. Students should develop an understanding of science and technology in local, national, and global challenges.

PS-AFES-4. Students will know the definition of an orbit and how an object is put into orbit. Students will know the steps in the motion analysis process. Students

will comprehend the concepts of weight, mass and inertia. Students will know and apply Newton's Laws of Motion.

a. Diagram and define an orbit.
b. Explain how an object is put into orbit from Earth.
c. Outline the steps in the motion analysis process.
d. Describe weight, mass and inertia.
e. Demonstrate Newton's laws of motion.

Academic Standard(s):

SP1. Students will analyze the relationships between force, mass, gravity, and the motion of objects.

PS5. Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.

SPS7. Students will relate transformations and flow of energy within a system.

SPS8. Students will determine relationships among force, mass, and motion.

SC6. Students will understand the effects motion of atoms and molecules in chemical and physical processes.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SCSh8. Students will understand important features of the process of scientific inquiry.

NATM. Understand patterns, relationships, and functions.

NATM. Represent and analyze mathematical situations and structures using algebraic symbols.

***NSS B.4.** Students should develop an understanding of motions and forces.*

***NSS B.5.** Students should develop an understanding of conservation of energy.*

PS-AFES-5. Students will know why spacecraft ground tracks look the way they do and what is required to move them.

a. Explain ground tracks and how spacecraft ground tracks are used.
b. Diagram and describe why certain types of missions use certain types of orbits.
c. Illustrate the steps needed to move a satellite from one orbit to another

Academic Standard(s):

SP1. Students will analyze the relationships between force, mass, gravity, and the motion of objects.

PS5. Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.

SPS8. Students will determine relationships among force, mass, and motion.

SC6. Students will understand the effects motion of atoms and molecules in chemical and physical processes.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SCSh8. Students will understand important features of the process of scientific inquiry.

NATM. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NATM. Recognize and apply mathematics outside of mathematics.

NSS B.4. Students should develop an understanding of motions and forces.

NSS B.5. Students should develop an understanding of conservation of energy.

NSS E.2. Students should develop understandings about science and technology..

PS-AFES-6. Students will know basic planning for a spacecraft's transfer from one planet to another after they escape Earth's gravitational pull.

a. Describe the steps needed for a spacecraft to travel from one planet to another.
b. Explain gravity-assist trajectories and how they can help spacecraft travel between the planets.

Academic Standard(s):

SP1. Students will analyze the relationships between force, mass, gravity, and the motion of objects.

SPS8. Students will determine relationships among force, mass, and motion.

SC6. Students will understand the effects motion of atoms and molecules in chemical and physical processes.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SCSh8. Students will understand important features of the process of scientific inquiry.

NSS B.4. *Students should develop an understanding of motions and forces.*

PS-AFES-7. Students will comprehend the history and purpose of ICBM's. Students will comprehend the Anti-Ballistic Missile Treaty. Students will know launch windows and how they constrain when we can launch into a particular orbit.

a. Define a ballistic trajectory.
b. Diagram six initial conditions of a ballistic trajectory.
c. Explain the purpose of Intercontinental Ballistic Missiles (ICBM's).
d. Identify key historical points in the development of ICBM's.
e. Describe the Anti-Ballistic Missile Treaty.
f. Define a launch window.
g. Determine time using Earth's rotation.
h. Compare and contrast sidereal time and solar time.

Academic Standard(s):
SSUSH20. The student will analyze the domestic and international impact of the Cold War on the United States.

SP1. Students will analyze the relationships between force, mass, gravity, and the motion of objects.

SCSh7. Students will analyze how scientific knowledge is developed.

SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

SES1. Students will investigate the composition and formation of Earth systems, including the Earth's relationship to the solar system.

MA2G4. Students will recognize, analyze, and graph the equations of the conic sections (parabolas, circles, ellipses, and hyperbolas).

MM3G2. Students will recognize, analyze, and graph the equations of the conic sections (parabolas, circles, ellipses, and hyperbolas).

NATM. Represent and analyze mathematical situations and structures using algebraic symbols.

NATM. Recognize and apply mathematics outside of mathematics.

NSS A.2. All students should develop understandings about scientific inquiry.

NSS B.4. Students should develop an understanding of motions and forces.

NSS E.2. Students should develop understandings about science and technology..

NSS F.6. All students should develop an understanding of science and technology in local, national, and global challenges.

NSS G.3. All students should develop an understanding of historical perspectives.

PS-AFES-8. Students will know the competing requirement of re-entry design. Students will know a re-entry corridor and its importance. Students will apply the motion analysis process (MAP) checklist to re-entry motion and discuss the results.

a. Identify the factors to consider in planning for spacecraft to re-enter Earth's atmosphere.

b. Define a re-entry corridor.

c. Explain how to apply the motion analysis process (MAP) checklist to re-entry motion.

Academic Standard(s):

SES1. Students will investigate the composition and formation of Earth systems, including the Earth's relationship to the solar system.

SES6. Students will explain how life on Earth responds to and shapes Earth systems.

SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

MA2G5. Students will investigate planes and spheres.

NATM. Understand patterns, relationships and functions.

NATM. Recognize and apply mathematics outside of mathematics.

NSS A.2. All students should develop understandings about scientific inquiry.

NSS. B.5. All students should develop an understanding of conservation of energy and increase in disorder.

PS-ASES-9. Students will know the systems-engineering process and how it is applied to designing space missions, spacecraft, and a spacecraft's major subsystems.

a. Describe the systems engineering process and how it is used in designing space missions.

b. Define payload and explain how payload requirements affect spacecraft design.

c. Diagram the major spacecraft subsystems.
d. Label and explain the elements of a remote-sensing system.

Academic Standard(s):
MA1G5. . Students will find and compare the measures of spheres.

MM1A2. Students will simplify and operate with radical expressions, polynomials, and rational expressions.

NSS. B.4. All students should develop an understanding of motion and forces.

NSS. E.1. All students should develop abilities of technological design.

NSS. E.2. All students should develop understandings about science and technology.

PS-AFES-10. Students will know the elements of a space-vehicle control system, including open-loop and closed-loop control systems, and know the steps in the control process.

a. Illustrate the elements of a space-vehicle control system.
b. Compare and contrast open-loop and closed-loop control systems.
c. Outline the steps in the control process.
d. Describe the functions of control systems.

Academic Standard(s):
SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh8. Students will understand important features of the process of scientific inquiry.

NSS. E.1. All students should develop abilities of technological design.

NSS. E.2. All students should develop understandings about science and technology.

PS-AFES-11. Students will know the main function of the environment control and life-support subsystems (ECLSS), the main sources of heat for a spacecraft, and how to apply systems engineering to designing and testing the ECLSS.

a. Compare and contrast the two main tasks of a spacecraft's environmental control and life-support subsystem.
b. Identify the main sources of heat for a spacecraft.
c. Diagram how to use the three basic means of heat transfer - conduction, convection, and radiation - and how to use them on a spacecraft.
d. Describe different ways to control heat outside and inside a spacecraft.
e. Explain how, from a standpoint of the life support, humans are viewed as systems with inputs and outputs.

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Academic Standard(s):

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh8. Students will understand important features of the process of scientific inquiry.

SC5. Students will understand that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst.

SC6. Students will understand the effects motion of atoms and molecules in chemical and physical processes.

SP2. Students will evaluate the significance of energy in understanding the structure of matter and the universe.

MA2D4. Students will understand the differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.

MA1D5. Students will determine an algebraic model to quantify the association between two quantitative variables.

MA1P4. Students will make connections among mathematical ideas and to other disciplines.

MA2P4. Students will make connections among mathematical ideas and to other disciplines.

NATM. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NATM. Represent and analyze mathematical situations and structures using algebraic symbols.

NATM. Recognize and apply mathematics outside of mathematics.

NSS. B.2. All students should develop an understanding of the structure and properties of matter.

NSS. B.5. All students should develop an understanding of conservation of energy and increase in disorder.

NSS. E.2. All students should develop understandings about science and technology.

NSS. G.3. All students should develop an understanding of historical perspectives.

PS-AFES-12. Students will know the basic operating principles of rockets from a systems perspective.

a. Explain how rockets work.

b. Define important parameters to describe rocket performance -thrust, specific impulse, and velocity change.

c. Illustrate how rockets convert stored energy into thrust.

d. Diagram the key elements of propulsion subsystems.

e. Explain the basic operating principles for the different types of rockets in use.

f. Compare and contrast the advantages and disadvantages of different types of rockets.

g. Describe the subsystems that make up a launch vehicle.

h. Define staging and explain the advantages and disadvantages of using staging for launch vehicles.

Academic Standard(s):

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh8. Students will understand important features of the process of scientific inquiry.

SC5. Students will understand that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst.

SC6. Students will understand the effects motion of atoms and molecules in chemical and physical processes.

SP2. Students will evaluate the significance of energy in understanding the structure of matter and the universe.

MA2D4. Students will understand the differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.

MA1D5. Students will determine an algebraic model to quantify the association between two quantitative variables.

MA1P4. Students will make connections among mathematical ideas and to other disciplines.

NATM. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

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NATM. Understand patterns, relationships, and functions.

NATM. Represent and analyze mathematical situations and structures using algebraic symbols.

NATM. Recognize and apply mathematics outside of mathematics.

NSS. B.1. All students should develop understandings about structure of atoms.

NSS. B.3. All students should develop an understanding of chemical reactions.

NSS. B. 4. All students should develop an understanding of motion and forces.

NSS. B.6. All students should develop an understanding of interactions of energy and matter.

NSS. E.2. All students should develop understandings about science and technology.

NSS. G.1. All students should develop an understanding of science as a human endeavor.

NSS. G.3. All students should develop an understanding of historical perspectives.

PS-AFES-13. Students will know the elements of the mission operations systems including communications, operations, management, and teamwork.

a. Identify mission operations systems.
b. Diagram the four operations systems that help get a launch vehicle and payload into space.
c. Illustrate the four elements of communication architecture that are important to communication between satellites and ground stations.
d. Describe the components of NASA's and DoD's major satellite-control networks.
e. Compare and contrast the roles of mission management and operations teams during the each mission phase.
f. List basic principles of team management.
g. Identify and explain some useful management tools.
h. Explain the advantages of spacecraft autonomy.

Academic Standard(s):
SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh8. Students will understand important features of the process of scientific inquiry.

SP2. Students will evaluate the significance of energy in understanding the structure of matter and the universe.

MA2D4. Students will understand the differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.

MA1D5. Students will determine an algebraic model to quantify the association between two quantitative variables.

MA1P4. Students will make connections among mathematical ideas and to other disciplines.

NATM. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NATM. Understand patterns, relationships, and functions.

NSS. A.2. All students should develop understandings about scientific inquiry.

NSS. B.4. All students should develop an understanding of motion and forces.

NSS. B.6. All students should develop an understanding of interactions of energy and matter.

NSS. E.2. All students should develop understandings about science and technology.

NSS. G.1. All students should develop an understanding of science as a human endeavor.

NSS. G.3. All students should develop an understanding of historical perspectives.

PS-AFES-14. Students will know emerging trends in the space industry based on markets, politics, and international law.

a. Describe emerging trends in the space industry.
b. Identify markets for commercial space activities, giving specific examples of each.
c. List political reasons for exploring space.
d. Explain seven key principles of international space law.
e. Describe the functions of the International Telecommunications Union.
f. Explain how national policies affect space missions.
g. Identify factors that contribute to the cost of a space mission.
h. Explain the importance of estimating costs when planning missions and the concept of internal rate of return.
i. Describe how the concept of internal rate of return affects investment in commercial space missions.

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Academic Standard(s):
SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh8. Students will understand important features of the process of scientific inquiry.

SSUSH20. The student will analyze the domestic and international impact of the Cold War on the United States.

SSUSH25. The student will describe changes in national politics since 1968.

MA2D4. Students will understand the differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.

NATM. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NATM. Understand measurable attributes of objects and the units, systems, and processes of measurements.

NATM. Recognize and apply mathematics outside of mathematics.

NSS. A.2. All students should develop understandings about scientific inquiry.

NSS. E.2. All students should develop understandings about science and technology.

NSS. F.6. All students should develop understandings about science and technology in local, national, and global challenges

NSS. G.1. All students should develop an understanding of science as a human endeavor.

PS-AFES-15. Students will identify US and Soviet manned space flights, the purpose of their missions, and they lessons learned during their space operations.

a. Create a timeline of the U.S. manned space flights and the purpose of their missions.

b. Create a timeline of the Soviet manned space flights and their mission purposes.

c. Describe the main elements of the Space Shuttle system starting with the early development and ending with the current program.

d. Explain how Shuttle operations work at NASA's Johnson Space Center.

e. Identify important concepts in the history of space stations.

f. Compare and contrast Europe's Spacelab with the International Space Station. Make mission and physical comparisons.

g. Describe scientific research that takes place onboard the International Space Station.

h. Explain living and working conditions in space.
i. Identify benefits of having future colonies in space.

Academic Standard(s):
SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh8. Students will understand important features of the process of scientific inquiry.

SSUSH20. The student will analyze the domestic and international impact of the Cold War on the United States.

SSUSH25. The student will describe changes in national politics since 1968.

NSS. E.2. All students should develop understandings about science and technology.

NSS. G.1. All students should develop an understanding of science as a human endeavor.

NSS. G.3. All students should develop an understanding of science as a human endeavor.

Reading Across the Curriculum

Reading Standard Comment

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, research, and learning. The Reading Across the

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Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

a. Reading in all curriculum areas
    - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
    - Read both informational and fictional texts in a variety of genres and modes of discourse.
    - Read technical texts related to various subject areas.
b. Discussing books
    - Discuss messages and themes from nooks in all subject area.
    - Respond to a variety of texts in multiple modes of discourse.
    - Relate messages and themes from one subject area to messages and themes in another area.
    - Evaluate the merit of texts in every subject discipline.
    - Examine author's purpose in writing.
    - Recognize the features of disciplinary texts.
c. Building vocabulary knowledge
    - Demonstrate an understanding of contextual vocabulary in various subjects.
    - Use content vocabulary in writing and speaking.
    - Explore understanding of new words found in subject area texts.
d. Establishing content
    - Explore life experiences related to subject area content.
    - Discuss in both writing and speaking how certain words are subject area related.
    - Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that student pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were

identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

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PROGRAM CONCENTRATION:
Government & Public Safety
CAREER PATHWAY:
JROTC – Air Force
COURSE TITLE: Leadership Education IV

Air Force Junior ROTC Curriculum

The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." McREL Standards and Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, McREL is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the National Council on Social Studies (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the Georgia Performance Standards for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

All McREL Standards and Benchmarks are available for AFJROTC instructors and authorized users at https://owa.afjrotc.net/cybercampus_prod/default.aspx in the Library under Curriculum, McRel Standards and Benchmarks. Additional national education standards are referenced in this copyrighted Cybercampus information. Georgia AFJROTC instructors should reference both the Georgia and McREL standards to meet both AFJROTC and Georgia student education requirements. Georgia Performance Standards for the National Endowment for Financial Education (NEFE) High School Financial Planning Program are available on line at hsfpp.nefe.org. Instructors should go to this website and register to receive access to these copyrighted performance standards when teaching the class.

Leadership Education 400: Principles of Management and process skills on the AFJROTC Cybercampus have been correlated with The Project 2061's *Benchmarks for Science Literacy*, National Council for Social Studies: Curriculum Standards for Social Studies, Center for Civic Education: National Standards for Civics and Government, National Standards for Business Education, National Assessment of Educational Progress: National Civics Consensus Project, Quigley's *Civitas*, A Framework for Civics Education, CNAEA: National Standards for Arts Education, GESP: National Geography

Standards, National Health Education Standards, NCHS: National Standards for History, NRC: National Science Education Standards, SCANS: Report for America 2000, and Health Framework for California Public Schools.

Course Description:
Leadership IV, Life Skills and Career Opportunities discusses principles of management. It includes definitions and histories of the discipline, conflict management, negotiation, and mentoring. It covers management techniques including principles and functions of management; management decisions involving conflict management, personal coping mechanisms, skills, roles, performance of management, and delegation; management functions of problem solving, decision making, negotiation, and mentoring, and managing one's self and others by managing self-development, time, and information.

PS-AFLEIV-1. Students will understand who managers are, where they work, what they do. They will know what management is.

1. Describe three characteristics of an organization.
2. List three examples of organizations.
3. Explain the difference between an operative and a manager.
4. Identify three levels of managers.
5. Define efficiency and effectiveness.
6. Diagram the four basic management processes.
7. Describe three kinds of management behavior.

Academic Standard(s):
SSEMI4. The student will explain the organization and role of business, and analyze the four types of market structures in the U.S. economy.

SCSh7. Students will analyze how scientific knowledge is developed.

PS-AFLEIV-2. Students will identify the skills and competencies successful managers possess, the importance the marketplace puts on managers, and how management relates to other disciplines of study.

1. List the four general skills of managers and the six specific skills of managers.
2. Define competencies.
3. Explain the importance the marketplace puts on managers.
4. Identify the reasons management is worth studying and how management relates to other disciplines of study.

Academic Standard(s):
SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

SCSh8. Students will understand important features of the process of scientific inquiry

SCSh7. Students will analyze how scientific knowledge is developed.

PS-AFLEIV-3. Students will compare the history of management from the classical contributions up to and including modern management.

1. Identify the contributions Adam Smith, Frederick Taylor, Henri Fayol, and Max Weber each made to the field of management.
2. Explain the influence of the industrial revolution on management practice.
3. Describe other major contributions to scientific management and why scientific management received so much attention.

Academic Standard(s):

SSEMI2. The student will explain how the Law of Demand, the Law of Supply, prices and profits work to determine production and distribution in a market economy.

SSUSH11. The student will describe the growth of big business and technological innovations after Reconstruction.

SSWH21. The student will analyze globalization in the contemporary world.

SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh7. Students will analyze how scientific knowledge is developed.

PS-AFLEIV-4. Students will analyze various approaches to management including the human resources approach and the quantitative approach. They will identify how social events shape management approaches as well as other influences on current management approaches.

1. Describe the contributions of Robert Owen and Hugo Munsterberg.
2. Discuss what Mary Parker Follett believed about managers and groups.
3. Compare and contrast the views of Chester Barnard and Max Weber.
4. Describe the Hawthorne Studies.
5. Identify the basic belief of the human relations movement.
6. Describe the approach of the behavioral science theorists.
7. List the applications of human resource approaches.
8. Give examples of the quantitative approach to management.
9. Identify a major factor that stimulated the classical and the human resources approach.
10. State the historical event that stimulated the quantitative approach.
11. Analyze the concept of a process approach, a systems approach, and a contingency approach to management.
12. Describe how classical writings are applied today.

Academic Standard(s):

SSEMI4. The student will explain the organization and role of business, and analyze the four types of market structures in the U.S. economy.

SSUSH11. The student will describe the growth of big business and technological innovations after Reconstruction.

SSWH21. The student will analyze globalization in the contemporary world.

SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh7. Students will analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

SSEMI2. The student will explain how the Law of Demand, the Law of Supply, prices and profits work to determine production and distribution in a market economy.

PS-AFLEIV-5. Students will understand how management affects the economy including the global marketplace and technology.

1. Create a timeline that identifies the three waves of civilization described by Alvin Toffler.
2. Name three examples of knowledge workers.
3. Describe a dot-com business.
4. Compare and contrast the difference between a multinational corporation and a transnational corporation.
5. Outline three stages of how globalization affects organizations.
6. Define technology and list three examples of technologies that benefit organizations.
7. Describe e-commerce.
8. Identify the two big challenges facing a manager of telecommuters.

Academic Standard(s):

SSEMI4. The student will explain the organization and role of business, and analyze the four types of market structures in the U.S. economy.

SSUSH11. The student will describe the growth of big business and technological innovations after Reconstruction.

SSWH21. The student will analyze globalization in the contemporary world.

SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh7. Students will analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

SSEPF1. The student will apply rational decision to the making of personal spending and savings choices.

SSEMI2. The student will explain how the Law of Demand, the Law of Supply, prices and profits work to determine production and distribution in a market economy.

PS-AFLEIV-6. Students will identify what society expects from organizations and managers. They will also know how entrepreneurship, the workforce, and labor impact society.

1. Compare and contrast the two basic positions on corporate social responsibility.
2. Select the definition of social obligation from a list of definitions.
3. Describe social responsiveness.
4. Explain the function of a code of ethics.
5. Identify the difference between an entrepreneur and a small business owner.
6. Outline the four stages of the entrepreneurial process.
7. Explain workforce diversity.
8. Describe work/life balance.
9. Compare and contrast outsourcing, rightsizing, and downsizing.
10. Explain the issues that contingent workers create for managers.
11. Identify the two demographic factors that contribute to the labor shortage.

Academic Standard(s):
SSEMI4. The student will explain the organization and role of business, and analyze the four types of market structures in the U.S. economy.

SSUSH11. The student will describe the growth of big business and technological innovations after Reconstruction.

SSWH21. The student will analyze globalization in the contemporary world.

SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

SCSh7. Students will analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

SSEMI2. The student will explain how the Law of Demand, the Law of Supply, prices and profits work to determine production and distribution in a market economy.

PS-AFLEIV-7. Students will be able to identify planning actions and types of plans including management by objectives.

1. Describe formal and informal planning.
2. List four reasons managers should make formal plans.
3. State two of the major criticisms of formal planning.
4. List four ways to describe different types of plans.
5. Compare and contrast strategic and tactical plans, specific and directional plans, and single-use and standing plans.
6. Define management by objectives (MBO) and list four common ingredients in MBO programs.
7. Describe the three basic findings of Locke's research on goal-setting.
8. Identify the six guidelines for setting employee objectives.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

SSEF4. The student will compare and contrast different economic systems, and explain how they answer the three basic economic questions of what to produce, how to produce and for whom to produce.

PS-AFLEIV-8. Students will establish goals and develop plans about contemporary issues and their personal lives.

1. Define traditional goal setting and identify the problems with the traditional goal setting approach.
2. Outline a means-end chain of traditional goal setting.
3. Describe the management by objective (MBO) approach to goal setting.
4. Identify the five characteristics of well-thought-out goals.
5. List the six steps in goal setting.
6. Identify the three contingency factors in planning.
7. Describe the difference between traditional and a modern planning.
8. Identify the two planning issues that are on the minds of contemporary experts.
9. Describe three characteristics of effective plans in dynamic environments.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

ELA9LSV1, ELA10LSV1, ELA11LSV1, ELA12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

SSEPF1. The student will apply rational decision to the making of personal spending and savings choices.

PS-AFLEIV-9. Students will use the decision-making process to address situations in their lives.

a. List the eight steps of a decision-making process.
b. Define decision criteria.
c. Explain how risk and uncertainty affect the decision-making process.
d. Describe the advantages of creativity in decision-making.
e. Explain the three components of creativity.
f. Define *satisfice.*
g. Describe three features of practicing bounded rationality.
h. List three common errors in the decision-making process.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

ELA9LSV1, ELA10LSV1, ELA11LSV1, ELA12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

SSEPF1. The student will apply rational decision to the making of personal spending and savings choices.

PS-AFLEIV-10. Students will identify the various decision making styles used by groups and individuals. They will also explain how culture effects the decision making process.

1. Explain the difference between well-structured and ill-structured problems.
2. Name two characteristics of programmed and non-programmed decisions.
3. List three types of programmed decisions.
4. Compare and contrast the types of decisions made by managers at lower and higher organizational levels.
5. Describe the benefits of expert systems and neural networks for decision-making.
6. Name the two dimensions that most influence decision-making styles.
7. List four basic decision-making styles and name the advantages and disadvantages of each.
8. State the size of the most effective groups.
9. Practice brainstorming and nominal group techniques.
10. Explain how decision-making is impacted by culture.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

SSEPF1. The student will apply rational decision to the making of personal spending and savings choices.

SSEF4. The student will compare and contrast different economic systems, and explain how they answer the three basic economic questions of what to produce, how to produce and for whom to produce.

SSEMI2. The student will explain how the Law of Demand, the Law of Supply, prices and profits work to determine production and distribution in a market economy.

PS-AFLEIV-11. Students will identify the forces of change that affect management and employee actions.

1. List the three categories that managers can change.
2. Name five external forces that create a need to change in organizations.
3. Describe the role of a change agent.
4. Explain the calm-water and white-water rapids metaphors for change.
5. Identify driving forces and restraining forces for change.
6. Describe the three phases for working on calm-water changes.
7. List three reasons why people resist change.
8. Name three techniques that can be used to encourage change.

Academic Standard(s):
SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

SCSh7. Students will analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry.

SSEPF1. The student will apply rational decision to the making of personal spending and savings choices.

SSEMI2. The student will explain how the Law of Demand, the Law of Supply, prices and profits work to determine production and distribution in a market economy.

SSEF4. The student will compare and contrast different economic systems, and explain how they answer the three basic economic questions of what to produce, how to produce and for whom to produce.

PS-AFLEIV-12. Students will examine the difficulties and advantages of organizational changes.

1. Describe the changing of structure, technology, and people in organizations.
2. Identify four techniques used in organization development programs.
3. Explain how opportunities, demands, and constraints create stress in organizations.

4. List five common causes of stress in organizations.
5. Compare and contrast role conflict, role overload, and role ambiguity.
6. Name and give examples of the three ways stress reveals itself in people.
7. Describe one special program used to reduce employee stress in organizations.
8. List the three outcomes of innovation in organizations.
9. Name the four steps in the creativity process.
10. Explain the seven characteristics of an innovative culture.

Academic Standard(s):
SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

SCSh7. Students will analyze how scientific knowledge is developed.

SSEF4. The student will compare and contrast different economic systems, and explain how they answer the three basic economic questions of what to produce, how to produce and for whom to produce.

PS-AFLEIV-13. Students will handle personal stress and incorporate time management skills into their lives for themselves and groups in which they are active.

a. Explain the difference between *eustress* and *distress*.
b. Describe Type A, B, and H personalities.
c. List three workaholic characteristics.
d. Describe several ways to make stress work for you rather than against you.
e. Name three burnout symptoms.
f. Explain the first two steps of managing your time.
g. Describe the technological paradox.
h. Explain what can be done before a meeting to make it more effective.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

SSEPF1. The student will apply rational decision to the making of personal spending and savings choices.

PS-AFLEIV-14. Students will identify personality traits and predict behavior and personality.

a. List the four kinds of behavior that are the focus of organizational behavior.
b. Name the three components of attitude.
c. Explain the three concerns about employee job attitudes.
d. Describe cognitive dissonance.
e. List the four dimensions of the Myers-Briggs type indicator.
f. Name the five factors in the Big Five model of personality.

g. Describe emotional intelligence and list the six dimensions of emotional intelligence.
h. Name the six job-fit types identified by John Holland.
i. Describe the proactive personality.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

ELA9LSV1, ELA10LSV1, ELA11LSV1, ELA12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

PS-AFLEIV-15. Students will comprehend the impact of perception, how individuals learn, and group behavior on management decisions.

a. Describe the impact of perception (attributions) on managers.
b. Identify internal and external explanations of behavior.
c. List three ways managers determine the causes of behavior.
d. Explain fundamental attribution error and self-serving bias.
e. Give examples of stereotyping and operant conditioning.
f. Describe social learning theory.
g. Identify four ways to shape behavior.
h. List the four basic concepts of groups.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

PS-AFLEIV-16. Students will describe the types of work teams, their characteristics, and their popularity.

a. Name three reasons teams are popular in businesses today.
b. List the five stages of team development.
c. Explain the difference between a work group and a work team.
d. List five types of work teams.
e. Explain the work of a problem-solving team and a cross-functional work team.
f. Identify one reason why entrepreneurs use teams.
g. Name six characteristics of high-performance teams.
h. Describe two characteristics of effective leadership.
i. Name three characteristics of a supportive climate for teams.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

ELA9LSV1, ELA10LSV1, ELA11LSV1, ELA12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

PS-AFLEIV-17. Students will identify contemporary team issues and methods used to turn individuals into team players.

a. Describe the challenges facing teams in an individualistic culture.
b. List two countries in which the team approach has been much easier to introduce.
c. Identify nine work team roles.
d. List three tools a manager can use to shape team behavior.
e. Explain the use of a probationary period.
f. Describe the difference between an individual reward and a team reward.
g. Describe four ways to bring new life to a mature team.
h. Explain two situations in which the advantages of diversity are most clearly seen.
i. Identify two causes of attrition on teams.

Academic Standard(s):
SCSh7. Students will analyze how scientific knowledge is developed.

SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

PS-AFLEIV-18. Students will understand and use the communication process, using information technology for written and verbal communications.

a. Name the five components of the communication process.
b. List four factors that affect the encoding of messages.
c. Describe the advantages and disadvantages of written communication and verbal communication.
d. Demonstrate the communication grapevine and three examples of both nonverbal communication and body language.
e. Explain how verbal intonation impacts communication.
f. Illustrate three examples of barriers to communication.
g. Describe actions managers can take to overcome communication barriers.
h. List five examples of the use of technology networks in communication.
i. Explain how knowledge is a major resource in an organization.

Academic Standard(s):
ELA9LSV1, ELA10LSV1, ELA11LSV1, ELA12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

ELA11LSV2, ELA12LSV2. The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.

PS-AFLEIV-19. Students will develop interpersonal skills in listening and feedback, delegation skills, managing conflict, negotiating, and writing evaluations.

a. Name the four essential elements of listening.

b. Explain two of the ways to make feedback more effective.
c. Describe the elements of effective delegation.
d. Explain three views of organizational conflict.
e. Name five styles for managing conflict.
f. Describe the process of negotiation and explain three of the methods (tips) for effective negotiation.
g. Describe the three purposes of written performance evaluations.

Academic Standard(s):
ELA9LSV1, ELA10LSV1, ELA11LSV1, ELA12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

ELA11LSV2, ELA12LSV2. The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.

PS-AFLEIV-20. Students will identify the difference between managers and leaders. They will also understand the various theories of leadership that have been developed to analyze management behavior.

a. Compare and contrast the various theories of leadership.
b. Name four important modes in which leaders operate.
c. List two sets of variables that push a leader to behave in one way or another.
d. Compare and contrast the leader-participation model, the situational theory of leadership and the charismatic leadership theory.
e. Explain the difference between vision and setting goals.
f. Explain how transformational leaders differ from transactional leaders

PS-AFLEIV-21. Students will identify essential traits of today's leaders including the essence of leadership.

a. Describe the two aspects of a team leader's job that are *not* part of a first-line manager's job.
b. Name the four roles that team leaders play.
~~3.~~c. Explain why a leader has to pay attention to cultural factors in leading.
~~4.~~d. List the five components of emotional intelligence.
~~5.~~e. Name the five dimensions of trust and why it is so important to leadership.
~~6.~~f. Explain how leadership is sometimes not all that important.

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Academic Standard(s):
SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

PS-AFLEIV--22. Students will understand the importance of goal setting, providing feedback, and developing protégés in both coaching and mentoring.

a. Compare and contrast a coach and a mentor.
b. Name three benefits of setting goals.
c. Explain two reasons mentoring is important in the business world.
d. Explain the difference between a mission statement and specific goals.
e. Describe how role modeling and feedback benefit a protégé.
f. List three techniques for giving feedback.
g. Name four ways to prepare a protégé for promotion.

Academic Standard(s):
SSEPF6. The student will describe how the earnings of workers are determined in the marketplace.

SSEPF1. The student will apply rational decision to the making of personal spending and savings choices.

Reading Across the Curriculum

Reading Standard Comment
After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, research, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

u. Reading in all curriculum areas
- Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.

- Read both informational and fictional texts in a variety of genres and modes of discourse.
- Read technical texts related to various subject areas.

v. Discussing books
- Discuss messages and themes from nooks in all subject area.
- Respond to a variety of texts in multiple modes of discourse.
- Relate messages and themes from one subject area to messages and themes in another area.
- Evaluate the merit of texts in every subject discipline.
- Examine author's purpose in writing.
- Recognize the features of disciplinary texts.

w. Building vocabulary knowledge
- Demonstrate an understanding of contextual vocabulary in various subjects.
- Use content vocabulary in writing and speaking.
- Explore understanding of new words found in subject area texts.

x. Establishing content
- Explore life experiences related to subject area content.
- Discuss in both writing and speaking how certain words are subject area related.
- Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that student pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

PROGRAM CONCENTRATION: Government & Public Safety
CAREER PATHWAY: JROTC – Air Force
COURSE TITLE: Aerospace Science: Survival

Air Force Junior ROTC Curriculum
The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." **McREL** Standards and

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Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, **McREL** is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the **National Council on Social Studies** (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the **Georgia Performance Standards** for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

All McREL Standards and Benchmarks are available for AFJROTC instructors and authorized users at https://owa.afjrotc.net/cybercampus_prod/default.aspx in the Library under Curriculum, McRel Standards and Benchmarks. Additional national education standards are referenced in this copyrighted cybercampus information. Georgia AFJROTC instructors should reference both the Georgia and McREL standards to meet both AFJROTC and Georgia student education requirements.

Course Description:

Survival introduces students to the physical and mental needs individuals must satisfy during varied survival situation. Students learn about survival preparedness, conditions affection survival, individual survivor needs, psychological aspects of survival, and the will to survive. They also learn required personal protection measures, where to find necessities required to maintain life, and orientation and traveling techniques to use during a survival situation. Students will learn what to do to maintain life in a survival situation—whether that situation is caused by a natural or manmade disaster. They learn to quickly assess their environment, determine immediate and long term actions for survival, and scientifically pursue survival in an unfamiliar environment.

PS-AFSUR-1. Students will identify elements of surviving in situations where their lives depend on their decisions.

a. Describe the survival actions individuals must take in any survival situation, regardless of surroundings, based on the letters in the word "survival."
b. Identify all the conditions that affect survival including environmental elements, personal status, and available survival equipment.
c. Describe the fundamental human needs during a survival mission that must be met for survivors to maintain life and return.
d. List and describe the psychological aspects of survival.
e. List seven ways a survivor can prepare to rule over natural reactions and stresses common to survival.
f. Explain the importance of having the will to survive in hopeless situations.

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Academic Standard(s):
SCSh3. Students will identify and investigate problems scientifically.

SCSh8. Students will understand important features of the process of scientific inquiry.
.
SES1 Students will investigate the composition and formation of Earth systems, including the Earth's relationship to the solar system.

SES5. Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

SES6 Students will explain how life on Earth responds to and shapes Earth systems.

SEV4 Students will understand and describe availability, allocation and conservation of energy and other resources.

SP3. Students will evaluate the forms and transformations of energy.

PS-AFSUR-2. Students will know basic personal protection procedures, treatments, and prevention measures when faced with survival situations.

a. List some of the most frequent injuries during a survival situation and demonstrate the performance of first aid procedures meeting and/or exceeding all standards of the American Red Cross (ARC) and/or American Heart Association's (AHA).for treatment of those injuries.
b. Describe the procedures for and importance of personal hygiene in a survival situation.
c. Identify and demonstrate how to use plants for medicine.
d. Identify the proper body temperature and diagram the internal and external influences that determine that temperature.
e. Analyze why clothing is an important asset to survivors and demonstrate proper wear and care of clothing in a survival situation.
f. Explain how the environment influences shelter sites, identify factors to consider before constructing the shelter, and demonstrate the four steps required to build a shelter.

Academic Standard(s):
SES5. Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

PS-AFSUR-3. Students will identify the five crucial elements needed to maintain life in a survival situation.

a. Illustrate some useful firecraft methods for varied survival situations.
b. Show how to prepare, care for, and use a survival kit in a survival situation and how to improvise when the needed equipment is not available.

c. Describe why a survivor must meet his nutritional needs and how the survivor can locate, identify, and obtain food in a survival situation.
d. Identify the types of plants that can be eaten in a survival situation.
e. Demonstrate how to locate, procure, purify, and store water to meet a survivor's daily needs.

Academic Standard(s):
SCSh3. Students will identify and investigate problems scientifically.

SES6 Students will explain how life on Earth responds to and shapes Earth systems

PS-AFSUR-4. Students will demonstrate basic area orientation and traveling principles.
a. Demonstrate knowledge and appropriate use of varied maps.
b. Use the Sun and the stars to determine direction and travel.
c. Identify factors that must be considered to determine if land travel is or is not a necessity in a survival situation.
d. Demonstrate varied signaling techniques and identify when and where these signaling techniques would be most effective.
e. Identify various recovery principles and demonstration the survivor's actions which would be taken in each scenario.

Academic Standard(s):
SSWG1 The student will explain the physical aspects of geography.

MA1G1. Students will investigate properties of geometric figures in the coordinate plane.

MA3A10. Students will understand and use vectors.

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations

Reading Across the Curriculum

After the elementary years, students are seriously engaged in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must

learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary; and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context. Beginning in the middle grades, students start to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

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   - Read both informational and fictional texts in a variety of genres and modes of discourse.
   - Read technical texts related to various subject areas.

d. Discussing books
   - Discuss messages and themes from books in all subject areas.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

e. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

f. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
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CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

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CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

Social Studies Skills Matrices

MAP AND GLOBE SKILLS GOAL:

The student will use maps to retrieve social studies information. I: indicates when a skill is introduced in the standards and elements as part of the content D: indicates grade levels where the teacher must develop that skill using the appropriate content M: indicates grade level by which student should achieve mastery, the ability to use the skill in all situations A: indicates grade levels where students will continue to apply and improve mastered skills.

Map and Globe Skills	K	1	2	3	4	5	6	7	8	9-12
1. Use cardinal directions	I	M	A	A	A	A	A	A	A	A
2. Use intermediate directions		I	M	A	A	A	A	A	A	A
3. Use a letter/number grid system to determine location			I	M	A	A	A	A	A	A
4. Compare and contrast the categories of natural, cultural, and political features found on maps			I	M	A	A	A	A	A	A
5. Use inch to inch map scale to determine distance on maps			I	M	A	A	A	A	A	A
6. Use map key/legend to acquire information from historical, physical, political, resource, product, and economic maps			I	D	M	A	A	A	A	A
7. Use map to explain impact of geography on historical and political events			I	D	M	A	A	A	A	A
8. Draw conclusions and make generalizations based on maps				I	M	A	A	A	A	A
9. Use latitude and longitude to determine location				I	D	D	D	M	A	A
10. Use graphic scales to determine distances on maps					I	M	A	A	A	A
11, Compare maps of the same place at different points in time and from different perspectives to determine changes, identify					I	M	A	A	A	A

trends, and generalize about human activities										

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INFORMATION PROCESSING SKILLS

GOAL: The student will be able to locate, analyze, and synthesize information related to social studies topics and apply this information to solve problems/make decisions.
I: indicates when a skill is introduced in the standards and elements as part of the content
D: indicates grade levels where the teacher must develop that skill using the appropriate content
M: indicates grade level by which student should achieve mastery, the ability to use the skill in all situations
A: indicates grade levels where students will continue to apply and improve mastered skills

Information Processing Skills	K	1	2	3	4	5	6	7	8	9-12
1. Compare similarities and differences	I	D	M	A	A	A	A	A	A	A
2. Organize items chronologically	I	D	D	M	A	A	A	A	A	A
3. Identify issues and/or problems and alternative solutions	I	D	D	D	D	M	A	A	A	A
4. Distinguish between fact and opinion		I	D	M	A	A	A	A	A	A
5. Identify main idea, detail, sequence of events, and cause and effect in a social studies context		I	D	D	M	A	A	A	A	A
6. Identify and use primary and secondary sources		I	D	D	M	A	A	A	A	A
7. Interpret timelines		I	D	D	M	A	A	A	A	A
8. Identify social studies reference resources for a specific purpose			I	M	A	A	A	A	A	A
9. Construct charts and tables			I	M	A	A	A	A	A	A
10. Analyze artifacts			I	D	D	M	A	A	A	A
11. Draw conclusions and make generalizations				I	M	A	A	A	A	A
12. Analyze graphs and diagrams				I	D	M	A	A	A	A
13. Translate dates into centuries, eras, or ages				I	D	M	A	A	A	A
14. Formulate appropriate research questions					I	M	A	A	A	A
15. Determine adequacy and/or relevancy of information					I	M	A	A	A	A
16. Check for consistency of information					I	M	A	A	A	A
17. Interpret political cartoons					I	D	D	D	M	A

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PROGRAM CONCENTRATION:
Government & Public Safety
CAREER PATHWAY:
JROTC – Air Force

COURSE TITLE: Aerospace Science: Honors Ground School

Air Force Junior ROTC Curriculum

The Georgia Performance Standards for the Air Force Junior ROTC curriculum are designed to provide students with the knowledge and skills necessary to "develop citizens of character dedicated to serving their community and nation." **McREL** Standards and Benchmarks were used for all AFJROTC courses except Astronomy, Survival, and Global and Cultural Studies. Supported by contracts with the U.S. Education Department, Office of Educational Research and Improvement, **McREL** is one of ten Regional Educational Laboratories at the forefront of research, practice, and evaluation related to standards-based education and it has been awarded standards-based classroom instruction as its national leadership area within the regional educational laboratory network. Global and Cultural Studies used the **National Council on Social Studies** (NCSS) correlation, a nationally recognized source for social studies standards. Astronomy and Survival were correlated to the Georgia Performance Standards. All AFJROTC courses were compared to the **Georgia Performance Standards** for Social Studies, Math, Language Arts, and Science, and specific correlations were listed following each AFJROTC standard where applicable. Technology is infused into all AFJROTC curriculum.

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Air Force Junior ROTC Curriculum

Aviation Honors Ground School is an advanced, more in depth study of previous aerospace topics. The course is the foundation for students interested in receiving a private pilot's license. Upon successful completion of this course, the student will be prepared to take the Federal Aviation Administration (FAA) Private Pilot Written Exam.

PS-AFHGS-1. Students will become familiar with pilot training, aviation career opportunities, and human factors in aviation.

a. Outline the role of the FAA with reference to General Aviation.
b. List the eligibility and limitation requirements for the Private Pilot License.

c. Diagram the Category/Class Rating, and additional opportunities in Aviation Careers.
d. Demonstrate proper Aeronautical Decision Making, workload management, and Pilot-In Command responsibility.
e. Explain how fitness for flight and aviation physiology as related to Alcohol, Drugs, and Performance are related and regulated.

ACADEMIC STANDARDS:
SCSh7. Students will analyze how scientific knowledge is developed.

SSCG15. The student will explain the functions of the departments and agencies of the federal bureaucracy.

PS-AFHGS-2. Students will understand the airplane components and systems.

a. Identify the basic components of an aircraft as well as the primary function.
b. Explain the advancements in modern technologies as they apply to aviation advancement.
c. Label the primary Flights Instrumentation of today's modern aircraft.
d. Diagram the powerplant and related systems with respect to operation and maintenance requirements for flight.

ACADEMIC STANDARDS:
SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SP1 Students will analyze the relationships between force, mass, gravity, and the motion of objects.

SP3 Students will evaluate the forms and transformations of energy.

SPS7. Students will relate transformations and flow of energy within a system.

PS-AFHGS-3. Students will become familiar with the four forces of flight, aerodynamic principles of stability, and load factors applied to aircraft.

a. Identify the relationship between lift, weight, thrust, and drag as they apply to aircraft in flight and at rest.
b. Recognize components of an aircraft and their uses.
c. Calculate weight and balance for a variety of load configuration.
d. Use appropriate tools to determine CG and fuel loads.

ACADEMIC STANDARDS:
SPS8. Students will determine relationships among force, mass, and motion.

SP1. Students will analyze the relationships between force, mass, gravity, and the motion of objects.

SP6. The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.

SPS7. Students will relate transformations and flow of energy within a system.

PS-AFHGS-4. Student will understand the important safety considerations, including collision avoidance precautions, right-of-way, and minimum safe altitudes.

a. Compare and contrast the classifications of airspace and their limitation and uses**.**
b. Identify appropriate Air Traffic Control services available to pilots.
c. Demonstrate knowledge and proficiency in using emergency procedures.
d. Demonstrate the ability to locate and use appropriate sources of flight Information.

PS-AFHGS -5. Student will learn the causes of various weather conditions, frontal systems, and hazardous weather phenomena. Understand how to recognize and avoid critical weather situations.

a. Use various sources to determine suitability of weather conditions for safe flight.
b. Interpret applicable weather charts and data products.

ACADEMIC STANDARDS:
SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SES5 Students will investigate the interaction of insolation and Earth systems to produce weather and climate.

MM1D2. Students will use the basic laws of probability.

MM1D3. Students will relate samples to a population.

MM1D4. Students will explore variability of data by determining the mean absolute deviation (the average of the absolute values of the deviations).

PS-AFHGS-6. Students will learn how to use data supplied by manufacturer in predicting airplane performance.

a. Obtain and interpret appropriate charts, manuals and checklist to determine safe flight conditions.
b. Demonstrate proficiency in using various flight computers and flight charts.

c. Demonstrate understanding and use Navigational aids such as VOR, ADF, and DME.

ACADEMIC STANDARDS:
SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SPS7. Students will relate transformations and flow of energy within a system.

SPS8. Students will determine relationships among force, mass, and motion.

MM1G1. Students will investigate properties of geometric figures in the coordinate plane.

MM1D1. Students will determine the number of outcomes related to a given event.

MM1D2. Students will use the basic laws of probability.

MM1D3. Students will relate samples to a population.

MM1D4. Students will explore variability of data by determining the mean absolute deviation (the average of the absolute values of the deviations).

PS-AFHGS-7. Student will demonstrate an understanding of accepted procedures and concepts pertaining to aeronautical decision making and judgment.

a. Recognize the importance of Aviation Physiology in making decisions relative to safety of flight.
b. Identify and state the effects of night illusions, hypoxia, and hyperventilation.

Reading Across the Curriculum

Reading Standard Comment

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

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Beginning with middle grades years, students begin to self-select reading materials based on personal interest established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, research, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

y. Reading in all curriculum areas
- Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
- Read both informational and fictional texts in a variety of genres and modes of discourse.
- Read technical texts related to various subject areas.

z. Discussing books
- Discuss messages and themes from nooks in all subject area.
- Respond to a variety of texts in multiple modes of discourse.
- Relate messages and themes from one subject area to messages and themes in another area.
- Evaluate the merit of texts in every subject discipline.
- Examine author's purpose in writing.
- Recognize the features of disciplinary texts.

aa. Building vocabulary knowledge
- Demonstrate an understanding of contextual vocabulary in various subjects.
- Use content vocabulary in writing and speaking.
- Explore understanding of new words found in subject area texts.

bb. Establishing content
- Explore life experiences related to subject area content.
- Discuss in both writing and speaking how certain words are subject area related.
- Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

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The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that student pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of career for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

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CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.

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Social Studies Skills Matrices

MAP AND GLOBE SKILLS GOAL: The student will use maps to retrieve social studies information. I: indicates when a skill is introduced in the standards and elements as part of the content D: indicates grade levels where the teacher must develop that skill using the appropriate content M: indicates grade level by which student should achieve mastery, the ability to use the skill in all situations A: indicates grade levels where students will continue to apply and improve mastered skills.

Map and Globe Skills	K	1	2	3	4	5	6	7	8	9-12
1. Use cardinal directions	I	M	A	A	A	A	A	A	A	A
2. Use intermediate directions		I	M	A	A	A	A	A	A	A
3. Use a letter/number grid system to determine location			I	M	A	A	A	A	A	A
4. Compare and contrast the categories of natural, cultural, and political features found on maps			I	M	A	A	A	A	A	A
5. Use inch to inch map scale to determine distance on maps			I	M	A	A	A	A	A	A
6. Use map key/legend to acquire information from historical, physical, political, resource, product, and economic maps			I	D	M	A	A	A	A	A
7. Use map to explain impact of geography on historical and political events			I	D	M	A	A	A	A	A
8. Draw conclusions and make generalizations based on maps				I	M	A	A	A	A	A
9. Use latitude and longitude to determine location				I	D	D	D	M	A	A
10. Use graphic scales to determine distances on maps					I	M	A	A	A	A
11, Compare maps of the same place at different points in time and from different perspectives to determine changes, identify trends, and generalize about human activities					I	M	A	A	A	A

Implementation date DRAFT
Fall 2010

INFORMATION PROCESSING SKILLS

GOAL: The student will be able to locate, analyze, and synthesize information related to social studies topics and apply this information to solve problems/make decisions.
I: indicates when a skill is introduced in the standards and elements as part of the content
D: indicates grade levels where the teacher must develop that skill using the appropriate content
M: indicates grade level by which student should achieve mastery, the ability to use the skill in all situations
A: indicates grade levels where students will continue to apply and improve mastered skills

Information Processing Skills	K	1	2	3	4	5	6	7	8	9-12
1. Compare similarities and differences	I	D	M	A	A	A	A	A	A	A
2. Organize items chronologically	I	D	D	M	A	A	A	A	A	A
3. Identify issues and/or problems and alternative solutions	I	D	D	D	D	M	A	A	A	A
4. Distinguish between fact and opinion		I	D	M	A	A	A	A	A	A
5. Identify main idea, detail, sequence of events, and cause and effect in a social studies context		I	D	D	M	A	A	A	A	A
6. Identify and use primary and secondary sources		I	D	D	M	A	A	A	A	A
7. Interpret timelines		I	D	D	M	A	A	A	A	A
8. Identify social studies reference resources for a specific purpose			I	M	A	A	A	A	A	A
9. Construct charts and tables			I	M	A	A	A	A	A	A
10. Analyze artifacts			I	D	D	M	A	A	A	A
11. Draw conclusions and make generalizations				I	M	A	A	A	A	A
12. Analyze graphs and diagrams				I	D	M	A	A	A	A
13. Translate dates into centuries, eras, or ages				I	D	M	A	A	A	A
14. Formulate appropriate research questions					I	M	A	A	A	A
15. Determine adequacy and/or relevancy of information					I	M	A	A	A	A
16. Check for consistency of information					I	M	A	A	A	A
17. Interpret political cartoons					I	D	D	D	M	A