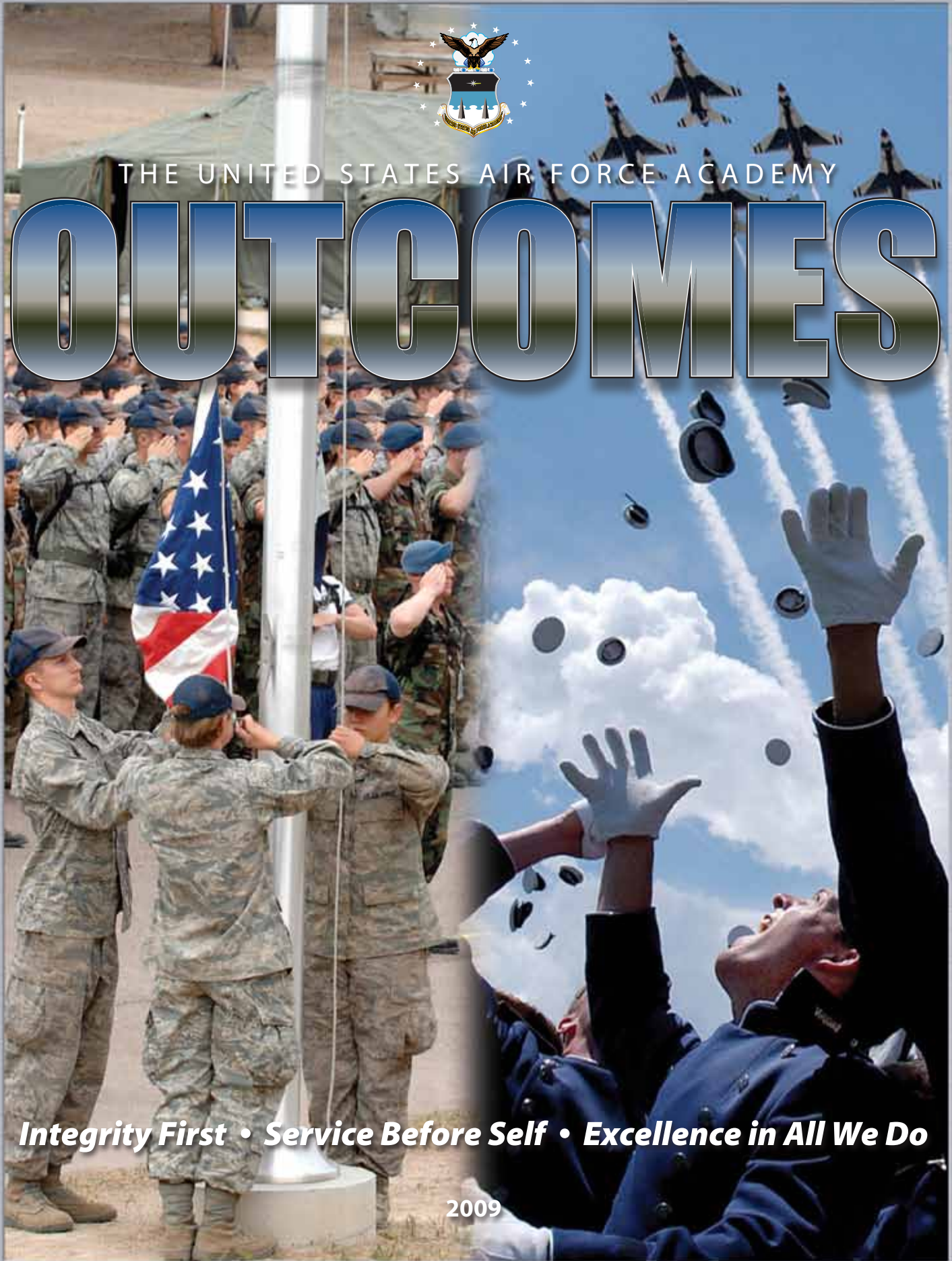




THE UNITED STATES AIR FORCE ACADEMY

# OUTCOMES



*Integrity First • Service Before Self • Excellence in All We Do*

2009



## **VISION**

The Air Force's premier institution for developing leaders of character

## **MISSION**

Educate, train, and inspire men and women to become officers of character motivated to lead the United States Air Force in service to our nation





## TABLE OF CONTENTS

<b>Section I</b> .....	<b>Page 2</b>
<i>Officer Development at the U.S. Air Force Academy</i>	
<b>Section II</b> .....	<b>Page 5</b>
<i>USAF A Outcomes</i>	
Responsibilities Outcomes .....	Page 5
Skills Outcomes .....	Page 12
Knowledge Outcomes .....	Page 21
<b>Section III</b> .....	<b>Page 28</b>
<i>Conclusion</i>	

# SECTION I

## OFFICER DEVELOPMENT AT THE U.S. AIR FORCE ACADEMY

The United States Air Force Academy is a unique institution. Graduating from the Air Force Academy involves not only a broadly based undergraduate education but also training in the profession of arms, a rigorous four-year regimen of physical education classes and competitive athletics, and a continuous grounding in character development. The program starts during the summer before Fourth-class year with what is called “Basic Cadet Training.” That’s the beginning of an integrated military, academic, athletic, and airmanship curriculum that culminates with each cadet earning a Bachelor of Science degree as well as being commissioned as an officer in the U. S. Air Force in service to his/her country.

This integrated curriculum, or course of instruction, is designed to develop critically important responsibilities, skills, and knowledge in cadets. Collectively, these are called the U.S. Air Force Academy’s Outcomes. These Outcomes were adopted officially by the Academy in 2007 after a year-long effort by a cross-functional team chartered to study and recommend a concise set of Outcomes which would help integrate the developmental contributions of the Academy’s key functional areas: the Dean of Faculty, the Commandant of Cadets, the Character and Leadership Development Center, the Director of Athletics, and the Academy’s varied airmanship programs.

The faculty and staff in these different organizations all contribute to the essential and enduring mission of the U.S. Air Force Academy: to educate, train, and inspire men and women to become officers of character motivated to lead the U.S. Air Force in service to our nation. Accomplishing this mission is a deliberate process, one which incorporates a strong *values-based foundation* regarding the importance of character-based officership, *shared outcomes* articulating what it means to be an officer of character, and an *integrated process* of cadet development.

### THE IMPORTANCE OF CHARACTER-BASED OFFICERSHIP

An officer’s identity is rooted in qualities of character that include a willingness to sacrifice one’s life in the discharge of one’s duties. An officer must establish his or her identity on a stable, well-supported foundation linked directly to fundamental principles of the American way of life (see Figure 1-1). The Constitution provides the legal and historical foundation; the Oath of Office affirms one’s commitment to these ideals while the Air Force Core Values guide all Airmen. Ultimately, our goal is character-based officership; the mission of the U.S. Air Force within the rapidly evolving global environment of the 21<sup>st</sup> century absolutely demands we train and inspire officers of character.

Officers of the military services are commissioned by the President to serve the nation. That commission states that in “reposing special trust and confidence in the patriotism, valor, fidelity, and abilities” of the officer, the nation may ask the officer to do “all manner of things” in service to their country. In practice, officers will execute critical missions in support of national security – including using lethal force, controlling nuclear weapons, leading men and women in dangerous environments, and conducting political-military engagements that define global relationships or help to build new nations. The nation needs to be able to trust that officers will faithfully execute their responsibilities in the national interest – regardless of personal security or desires, political affiliations, or physical and mental challenges.

Our government’s and our nation’s trust empowers officers with the freedom of action to employ the best means toward achieving national objectives, ensuring the greatest degree of success at minimal cost in terms of lives and resources. Thus, the trust between the people of the United States and its military officers is essential to our national security. This trust is earned and reinforced by the actions of officers of character, and weakened by the actions of those who lack character.

Officers establish their critical identity as an officer of character by committing to support the Constitution of the United States through their oath of office and by exemplifying the Core Values in their daily actions.



Figure 1-1. Foundations of Character-Based Officership

### THE USAFA OUTCOMES DEFINE WHAT WE MEAN BY “LEADERS OF CHARACTER”

Leaders of character must demonstrate a sophisticated combination of qualities by employing responsibilities, skills and knowledge as members of the profession of arms. At the Academy, we have described the characteristics in the USAFA Outcomes (see Figure 1-2). In short, these Outcomes represent the characteristics that cadets must exhibit upon graduation from the Academy.

The USAFA Outcomes reflect the two complementary roles the Air Force Academy plays within the American landscape: developing commissioned officers and providing a college education. As a commissioning source, the Academy has an obligation to the Air



Force to address the competencies essential for all Airmen. As a result, our USAFA Outcomes are closely aligned with the Air Force's "Institutional Competency List." This ensures that our graduates are well-positioned to have successful careers leading the Air Force in service to the nation.

Besides being a commissioning source, the Academy also confers college degrees. Indeed, we are one of the most prestigious institutions of higher education in the country, and every one of our graduates receives a fully-accredited Bachelor of Science degree. As such, we must demonstrate that we meet the widely shared standards of excellence among American colleges and universities. As a result, our Outcomes are also closely aligned with the "Essential Learning Outcomes" detailed in the Association of American College and Universities' publication, *College Learning for the New Global Century*, which stated that Outcomes "turn a spotlight on the kinds of knowledge, skills, and values that are needed to prepare today's students for an era of greater expectation in every sphere of life."



Commission **leaders of character** who embody the Air Force core values . . .

- . . . Committed to Societal, Professional, and Individual **Responsibilities**
  - Ethical Reasoning and Action
  - Respect for Human Dignity
  - Service to the Nation
  - Lifelong Development and Contributions
  - Intercultural Competence and Involvement
- . . . Empowered by Integrated Intellectual and Warrior **Skills**
  - Quantitative and Information Literacy
  - Oral and Written Communication
  - Critical Thinking
  - Decision Making
  - Stamina
  - Courage
  - Discipline
  - Teamwork
- . . . Grounded in essential **Knowledge** of the Profession of Arms and Human and Physical Worlds
  - Heritage and Application of Air, Space, and Cyberspace Power
  - National Security and Full Spectrum of Joint and Coalition Warfare
  - Civic, Cultural, and International Environments
  - Ethics and the Foundations of Character
  - Principles of Science and the Scientific Method
  - Principles of Engineering and the Application of Technology

Figure 1-2. USAFA Outcomes

## ALL PARTS OF THE ACADEMY WORK IN AN INTEGRATED WAY IN DEVELOPING THE OUTCOMES IN CADETS

The integrated nature of cadets' learning experiences is a big part of what makes the Academy unique. Many colleges and universities offer diverse academic courses, as well as rich co-curricular activities outside of class. However, at many schools, those experiences are not linked in any obvious way. While students may spend four years "collecting the dots," they may not be very successful "connecting the dots" of their education. Here, we are committed to working together to make "connecting the dots" a reality. The development of courage across multiple cadet experiences, as depicted in the photos on the left, represents one vivid example.

Cadet courses and programs are structured deliberately to complement each other developmentally. For example, the exercises and training that cadets experience to develop courage in Basic Cadet Training are complemented by their subsequent activities and lessons in physical education courses, academic classes, and character development seminars. As a result, the whole of each cadet's experience is much greater than the sum of each respective part of his/her training.

One important way that the Academy fosters greater integration and understanding across courses, programs, and cadet experiences is through the formation of Outcome Teams. Each team consists of 5-10 staff and faculty from across the Academy who work together to coordinate relevant courses and programs to best nurture and promote cadet development of a particular Outcome.

Membership of the Outcome Teams is carefully designed to include leadership from core courses or programs that contribute substantively to that Outcome. As a result, each team member is able to bring insights from his/her program to the Outcome Team and from the Outcome Team back to their program. Because every core program or course is represented on at least one Outcome Team, cadets can be assured that there are clear links between their daily efforts in each of their core programs and the larger USAFA Outcomes. Each team is led by experts whose professional education and Academy responsibilities mark them as role models, mentors, and leaders in their team's focus area.



Completing challenging academic assignments



Facing mental and physical challenges in Basic Cadet Training



Confronting fears in the Physical Education programs



Wrestling with ethical dilemmas during Character Development programs





## SECTION II

### USAF OUTCOMES

#### Responsibilities Outcomes

*At first glance, the word responsibility may seem to be an unusual choice to describe a domain of our Outcomes. The word may be associated more with the requirements of a job, as in a “set of responsibilities.” Our choice of it for this domain of our Outcomes, however, underscores the personal, social and professional responsibilities that must be internalized and embraced by our graduates by virtue of the oath of office they take. They represent something central and important about what cadets need to know and be able to do. Even more, they represent something fundamental about the kind of people they are, as evidenced by the personal, social and professional standards to which they aspire and hold themselves accountable.*

### Ethical Reasoning and Action

#### *A Responsibilities Outcome*

The hallmark of officers of character is morally sound, character-based decision making, along with the moral strength to carry through on these often difficult decisions. Such traits are important in every profession, but in the profession of arms, where lethal force is an option and the stakes may be extreme, making morally sound decisions and seeing them through could not be more critical.

When faced with challenging situations, officers must first have the awareness to recognize that a moral issue is at stake, and then apply a systematic process for dealing with dilemmas and ambiguity to determine the right way-ahead.

Ethical Reasoning and Action really means having the head, heart, and hands to do the right thing. The head means recognizing the moral aspects of a situation and applying a process to weigh the moral soundness of possible solutions. The heart means considering personal and organizational values and the human dimension when weighing the moral merit of the possible responses. Finally, hands refer to having the moral fortitude to carry out the decision, even when it is difficult and involves paying a personal price to do the right thing.





Ethical Reasoning and Action is embodied by three components:

- *Character-based decision making* – reflecting on the moral aspects of a situation before responding, and then applying a decision-making process that arrives at a morally correct response even in conditions of ambiguity, risk, or uncertainty.
- *Moral behavior* – modeling morally sound decisions and actions – setting a powerful example for others, including consistently moral behavior in both personal and professional relationships; also includes cultivating individuals and teams that make morally sound choices and carry them out, and promoting and sustaining a moral climate within one’s organization.
- *Accountability* – embracing the imperative to do the right thing and taking responsibility for one’s choices, regardless of personal consequences; holding peers to a professional standard and acknowledging their contributions; commitment to self, peers, subordinates, and superiors meeting the expectations of military officers, and stewardship of people and resources entrusted to you.

From the beginning of their 47 months at the Academy, cadets are exposed to the Air Force Core Values of Integrity First, Service Before Self, and Excellence In All We Do, as vital components of the Air Force way of life. During Basic Cadet Training, cadets participate in Core Values and Honor education. During the academic year, moral decisions and actions are embedded in an array of training experiences that range from abiding by rules during intramurals to rating subordinates honestly in the Military Performance Appraisal process. Core education experiences such as a required Philosophy course investigate and discuss the foundations of moral reasoning, as well as the importance of moral choices in science or engineering. Many athletic programs and military training opportunities expose cadets to character-based living. Their day-to-day experiences, including residing in cadet-led squadrons, provide them with countless opportunities to wrestle with moral issues within the cadet culture.

Ethical Reasoning and Action is a vital, foundational Outcome for developing officers of character. By the time cadets graduate, they must be ready to deal with the complexities of real-world challenges, yet make morally sound, character-based decisions. The American people count on military leaders who have the character to do the right thing while executing the nation’s most serious business.





## Respect for Human Dignity

### *A Responsibilities Outcome*

*"I'm not concerned with your liking or disliking me ...  
All I ask is that you respect me as a human being."  
— Jackie Robinson*

Jackie Robinson's quote was born out of the harsh racial segregation of his times. His message, however, is timeless. In a diverse Air Force, people do not always agree with others in their units. We don't necessarily like all the people in our units. However, respect is necessary for the success of our diverse Air Force. Whether negotiating with an insurgent or counseling subordinates, effective human relationships are founded in Jackie Robinson's idea that we respect everyone as a human being.

Respect for Human Dignity (RFHD) is a multifaceted concept that encompasses our thoughts, our feelings, and our actions. Our relationships with others, from our most intimate friendships to the command of military units, are affected by both the overt and the subtle ways we convey our respect for others. The military is a microcosm of society, attracting diverse people who must develop cohesive units, collectively able to carry out a frequently lethal mission. Members of the military must move beyond personal biases and see everyone as deserving of respect and fair treatment.

Respect can be defined in many ways, but the essence of respect is captured in this statement by a member of the Class of 2009: "Respect for human dignity is the action and way of thought that all people have worth and should be treated as such." However, even with a good definition, we are left with the question of

"How do we develop people to be respectful?" The dimensions of respect defined in our USAFA Outcomes provide a good starting point for the process of developing and assessing RFHD.

- The dimension of *self-respect* is foundational to the ability to demonstrate respect for others. One cannot show outward respect unless one first is able to show inward respect.
- The dimensions of *ethical treatment and professional treatment* make it clear that respect goes beyond just knowing the right action to acting on one's knowledge and doing the right thing.
- Finally, promoting *an environment where others grow in their ability to respect others* is crucial to sustaining a respectful and diverse military culture.

Creating a four-year course of instruction that fosters growth in respecting others is a challenging assignment. An even more challenging task is to sustain an organizational culture in which RFHD is part of the fabric of our interactions with each other. In many ways, RFHD is something "caught" as much as it's "taught," and therefore all parties assigned to the Air Force Academy must appreciate and enact values that inspire respect for human dignity. The development of RFHD starts with leveraging personal leadership as a Fourth-class cadets and providing new cadets the opportunity to reflect on what it means to be a cadet and future officer. Quite simply, any programs created to foster growth in RFHD will be ineffective unless there is an environment that *demonstrates* RFHD at all levels and provides opportunities to reflect and learn about RFHD in multiple contexts.

Learning to respect others in a diverse world also requires training and education across a wide range of situations and opportunities. An array of Academy experiences are linked together to create a mosaic of information and perspectives that increase understanding of different people, cultures, and beliefs. These include academic courses in the behavioral sciences, political science, and English; military training activities like Basic Cadet Training and Combat Survival Training; and character development and human relations classes and seminars. Integrating cadet experiences across their four years as cadets and across the different mission elements is essential to creating a culture conducive to developing respect for others.

Through an integrated, four-year focus on RFHD, the people of the United States can be assured that their military officers are ready for the challenges of interacting with others in the global environment. Learning to respect others is vital to the success of our Air Force. Perhaps another cadet from the class of 2009 summarizes the goal of the RFHD outcome best: "Respect for human dignity is treating others with a mature and responsible consideration for their basic rights; respecting the basic worth of another human being; and treating others with decency and empathy." Graduating officers with the attitudes and behaviors described by this cadet is a goal we should all strive to attain.



## Service to the Nation

### *A Responsibilities Outcome*

Why is the concept of Service to the Nation important? A heartfelt desire to serve the nation strengthens the professional identity, morale, and performance of all those entrusted with the nation's defense. Serving national interests goes to the very heart of a military academy's unique role as an undergraduate professional-academic institution. Here at the Academy our commitment to service helps foster the pursuit of knowledge so vital to the institution's educational and professional purposes. That learning, in turn, deepens the value cadets place on being part of a professional community of service. From this perspective, Service to the Nation is a highly desirable trait for any military officer, and recognizes the virtue and necessity of applying knowledge to a life of service.

And just what do we mean by Service to the Nation? It is best described in terms of duties or obligations to national values or interests. Learning to understand and accept such responsibility involves exploring fundamental questions such as what duties are binding and under what circumstances? Are there hierarchies of service obligations, such as the Oath to the Constitution? How do general principles of service apply to situations that present us with competing demands?

To help cadets build the sort of judgment needed to serve the nation responsibly, we focus on the following four aspects of Service to the Nation.

- *Selflessness* refers to personal service for the purpose of advancing a greater good or cause – in our case, that of the nation. Learning *selflessness* involves cadets in exploring a presumptive virtue of national service: what is good for the nation is good for the officer. *Selflessness* takes moral courage and thoughtful subordination to collective goals.
- *Loyalty* is important because of the lethal capabilities of our military and the democratic traditions of our society. Because constitutional interpretations, personal circumstances, and official roles can vary, learning *loyalty* requires going beyond blind obedience to a given authority. It should include challenging cadets with situations that invite them to reason through their commitment to principles, which they demonstrate through their actions.
- *Being Prepared to Risk One's Life* is an ultimate responsibility and potential sacrifice of Service to the Nation. Accepting that one's life might be lost while serving his or her country increases an officer's ability to make decisions of moral and personal strength during times of crisis or when they may be threatened or vulnerable. We present cadets with various problems that require them to think about committing themselves and others to assume life-altering risks.
- *Sense of Duty* is an obligation-oriented mindset that enables an individual to embrace all three preceding





aspects of Service to the Nation. Cadets are challenged with daily opportunities to fulfill professional obligations to individuals, teams, units, and other groups that comprise our institution and Air Force.

Service to the Nation is developed in a variety of events across all four years of a cadet's experience. The thread of activities selected for the Service to the Nation Outcome consist of the following: Fourth-class cadets – First Year Experience class and Center for Character Development's character seminars, as well as Core Values Education during Basic Training; Third-class cadets – core Law and Military Strategic Studies courses and the Respect and Responsibility character seminar; Second-class cadets – Operation Air Force and a character and leadership seminar; First-class cadets – core Military Strategic Studies class and the final character seminar. In addition, certain squadron activities and the competencies within the Military Performance Appraisal address Service to the Nation attributes.

Service to the Nation is a commitment we need in our military officers and therefore a critical Responsibility to develop in cadets. By presenting cadets with enduring questions, challenging situations and demanding scenarios, we assist them in thinking for themselves, helping them develop their judgment about how to best to serve the nation.

## Lifelong Development and Contribution

### *A Responsibilities Outcome*

Lifelong Development and Contribution is the pursuit of continual personal and professional development to assure present and future effectiveness as individuals, teams and organizations in face of ever-changing challenges. In many ways, this Outcome represents a synthesis of two of our Core Values, *Service Before Self* and *Excellence in All We Do*; it focuses on commitment to excellence in developing ourselves, our wingmen, and our organizations. Understanding, embracing and mastering the perspectives needed for lifelong development is critical because the Academy's success depends on its ability to produce well-rounded officers and leaders, open to new ideas and skills, and dedicated to continual improvement of both themselves and the military.

To help cadets develop commitment to and proficiency in this Outcome, the Academy focuses on three particular dimensions:

- *Self-Awareness and Improvement* is a lifelong process of identifying and demonstrating a clear understanding of personal strengths and weaknesses, and then working to improve as needed. Self-awareness takes courage to highlight weaknesses and work on improving them to continue personal and professional development.
- *Commitment to Developing Followers* moves the cadet past the focus on self towards a clear understanding of the importance and the ability to commit to developing

their followers. Cadets must continue to proactively seek constructive feedback and information for themselves, but also must provide feedback for those in their charge. This dimension is a major force multiplier and contributes tremendously to the quality of the Air Force workforce.

- *Commitment to Developing Organizations* is the highest and most complex dimension to achieve. Key to this dimension is recognizing the importance of developing the organization and identifying and understanding organizational strengths and weaknesses. This involves critical analysis of the organizational core competencies, mission, and vision to find and provide solutions to help make the organization better. Consistent with the other two dimensions, it is critical for cadets to seek constructive feedback and information to improve the organization.

One of the goals of the Academy is to expose and immerse cadets in many different programs and environments to develop self-awareness and subsequently Lifelong Development and Contribution. For example, in both the fall and spring semesters of their Fourth-class year, cadets participate in a strategies for success program called First Year Experience. One component of this program includes self-awareness learning exercises such as study skills, learning diagnostics, learning styles, and time management. Cadets follow each learning activity with reflective exercises designed to help them assess their strengths and weaknesses. In addition, every individual cadet selects a faculty mentor to provide one-on-one feedback and mentorship to help them understand how to work on their weaknesses and build lifelong character and leadership.

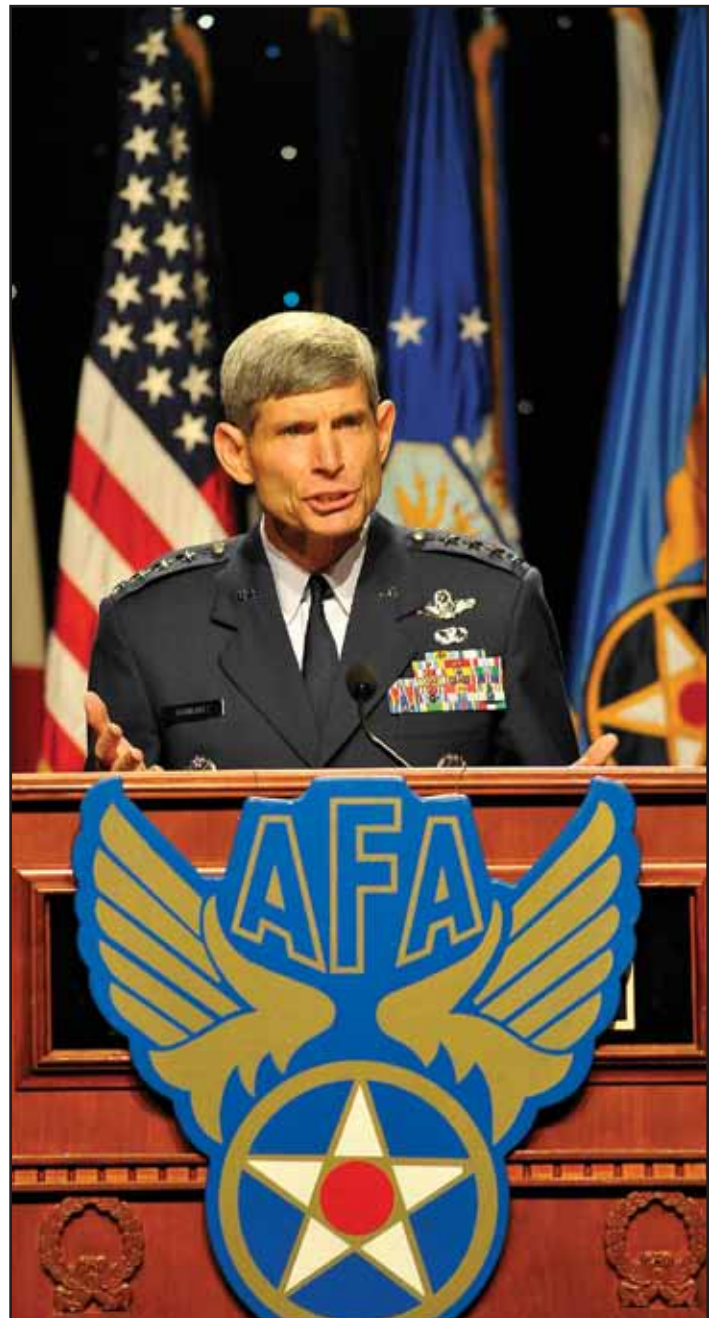
As another example, in their First-class year, cadets take an academic course called Management and Command, which focuses on helping students understand and influence their organizational environment through experiential exercises and organizational studies. In addition to these exercises, the cadets apply organizational methods and frameworks in threaded blog discussions on different organizational scenarios throughout the semester with students at the Academy and other universities.

The Academy directly assesses the outcome of Lifelong Development and Contribution in several ways. One way is a Foundation for Leadership Development course in the Second-class year. This course focuses on the leadership development process and the factors that affect this process. In particular, the Outcome is measured through several leadership application papers that have each cadet assess his or her current leadership style, get feedback from squadron members and develop an individual development plan for their personal leadership development while at the Academy. In addition, the cadets analyze a case study at the organizational level and determine courses of action as part of the assignment.

Another way the Academy assesses the development of Lifelong Development and Contribution in cadets is with the use of the state-of-the-art “360-degree feedback” system in which every cadet receives feedback on a range of leadership competencies appropriate to his or

her military position and class year (it’s called 360-degree feedback because cadets receive feedback from their cadet commanders, cadet peers, and cadet subordinates (if any), as well as faculty and staff). Among the competencies assessed relevant to Lifelong Development and Contribution are seeking feedback to increase self-awareness, empowering and inspiring others, committing to develop the talent of others, and supporting organizational goals and policies.

The Academy’s success depends on its ability to produce well-rounded officers and leaders. Through its Lifelong Development and Contribution Outcome, the Academy keeps its sights set on producing leaders of character dedicated to ongoing development of themselves, of their teams, and of their organizations.







## Intercultural Competence and Involvement

### *A Responsibilities Outcome*

Ongoing wartime operations demonstrate the need for our officers to be equipped with skills that go beyond the traditional warrior mentality in their operational specialty. Air Force officers of the 21<sup>st</sup> century operate in challenging and complex cultural environments and serve increasingly in coalition operations. They must possess the language and cultural skills necessary to navigate an increasingly complex cultural terrain. We define this Outcome as the ability to accurately understand, then appropriately and effectively act to achieve the desired effect in a culturally complex environment.

Intercultural Competence can also be described as a process of development and maturation from a mono-cultural or inward-looking perspective to a multi-cultural or outward-looking perspective. An officer with strong Intercultural Competence is characterized by understanding and being accepting of other cultures without sacrificing or compromising one's own culture and values. An officer who has a deep appreciation of and respect for the integrity of cultures, including one's own culture, will be better able to influence, negotiate and achieve the desired effects or accomplish the mission, in a multi-cultural environment.

All Academy cadets begin their formal journey toward Intercultural Competence in a foreign language classroom. The initial foreign language courses provide a foundation, not only in the mechanics of the language, but also in the foreign culture. A window is opened into another world and culture that is, perhaps, unfamiliar; students must grapple with differences in perspective and worldview.

Intercultural Competence development continues throughout the rest of the cadet's academic experience in history, political science,

social science and other courses. Approximately 800 cadets per year also have the opportunity to participate in language or cultural immersion programs in a foreign country or in summer operational experiences overseas, which provide a significant boost to their intercultural competence. Research in this area suggests that higher levels of Intercultural Competence cannot be achieved without spending significant time in a foreign culture. Interviews with cadets who have participated in foreign language and cultural immersion programs support the idea that significant growth and maturation takes place as a result of these experiences.

Intercultural Competence is a critical learning Outcome for the officer of the 21<sup>st</sup> century. To be effective leaders, Academy graduates must have a strong intercultural competence that will be further developed as they progress in their Air Force careers.





### **Skills Outcomes**

*One essential measure of a good education is what graduates can do, not just what they know. Knowledge is essential, and is one of the three major domains of our Outcomes, but it's also essential to be explicit about the most important skills we seek to develop in cadets.*

## **Quantitative and Information Literacy**

### *A Skills Outcome*

Imagine trying to succeed in today's world without the benefit of Quantitative and Information Literacy. "The twenty-first century is a world awash in numbers," says Lynn Arthur Steen, author of *Mathematics and Democracy: The Case for Quantitative Literacy*. And Rutherford Rogers, a contemporary librarian formerly at Yale University, has written, "We're drowning in information and starving for knowledge." Being able to deal effectively and efficiently with today's information-rich environments – which often necessitate technical interpretation and analytical abilities – is critical for the Air Force officer of today and tomorrow.

Air Force officers routinely need to make timely decisions that require first "getting up to speed." Knowing where and how to acquire necessary information and then being able to analyze, synthesize and apply it – sometimes rapidly – is a requisite skill.

Integrated teams need to find and pool disparate resources in coherent ways to frame ill-defined problems. Commanding officers

need relevant talking papers and succinct, cogent background papers. Decisions at all levels and of all kinds are predicated upon having the right information at the right time and knowing the right things to do with the knowledge.

The need for quantitative literacy abounds. For example, Air Force officers may be called upon to interpret graphs and tables of data indicating how well a tactic or strategy is working against insurgents. They may be called on to make million dollar decisions regarding a new weapons system based on financial and technical information. They may need to quickly analyze temperatures or the fuel volume of their aircraft while performing combat operations.

Air Force leaders are regularly called on to make important decisions by critically evaluating data and information of all kinds. Such a decision making process requires confidence, skill, and familiarity with quantitative and qualitative data and analysis.

At the Academy, we concur with a report published in 2000 called *Mathematics and Democracy: The Case for Quantitative Literacy*, recently published by The National Council on Education and the Disciplines. Quantitative Literacy is "an aggregate of skills, knowledge, beliefs, dispositions, habits of mind, communication capabilities, and problem solving skills that people need in order to engage effectively in quantitative situations arising in life and work." Quantitative Literacy has multiple dimensions. For cadet development, the focus is on these four facets:

- Interpreting and constructing mathematical models such as formulas, graphs, and tables, and drawing inferences from them.



- Representing quantitative information (e.g., symbolically, visually, numerically, verbally) using appropriate technology.
- Applying a wide variety of analytical methods to solve real world problems.
- Critically evaluating mathematical models and solutions to determine reasonableness and identify potential errors.

We define Information Literacy as the set of skills needed to find, retrieve, analyze, evaluate, and effectively and ethically apply information. Several distinct but related facets must all come together to produce an information-literate person who:

- Defines and articulates a need for information;
- Locates information sources, exploits information technology and accesses information to build knowledge;
- Critically evaluates sources and information;
- Uses information effectively to accomplish a specific purpose; and
- Understands the economic, social, ethical, and legal issues surrounding the access and use of information.

The Academy core curriculum of courses and programs helps develop these skills in cadets through networked sequences of courses. There are separate sequences specifically targeting Quantitative Literacy and Information Literacy, and each course or program in each sequence plays a unique role. For example, in Quantitative Literacy, when becoming literate in interpreting mathematical models, cadets in Calculus I might be expected to perform at an introductory level (i.e., able to interpret simple mathematical models and make inferences that are generally defensible but not very well-developed). On the other hand, cadets in Introduction to Astronautics might be expected to perform at an advanced level of literacy (i.e., able to interpret highly complex mathematical models and make inferences that are always defensible and well-developed).

The traditional definition of literacy pertains primarily to reading and writing abilities. Today's world of ubiquitous information and quantitative data requires new skills for retrieving, interpreting, and appropriately applying the vast amounts of data available to the average person. Like the more traditional reading and writing literacy of the last century, the Quantitative and Information Literacy Outcome is the stepping stone to a greater understanding of and effectiveness in the modern world. Mastery of Quantitative and Information Literacy is a requirement for solving the problems of today and the future, and it has become a critical measuring stick of opportunity, advancement, and development for societies and a necessary skill for every graduate of the Air Force Academy.



## Oral and Written Communication

### *A Skills Outcome*

The need for a military officer to communicate precisely and clearly has been validated by centuries of military history. For example, during the Spanish–American War when Colonel Theodore Roosevelt ordered his “Rough Riders” to charge up San Juan Hill, he simply said, “Let all brave men follow me.” Despite heavy fire, some even at point blank range, the charge was successful. A more current example associated with the Air Force might be a mission briefing presented by the squadron commander immediately before the start of a lengthy combat mission. The mission might involve multiple fighter and tanker aircraft in a carefully choreographed and sequenced array of essential actions in support of U.S. Army ground troops. The “communicator” needs to ensure clarity of purpose, and provide motivation and inspiration toward success. The complexity of each mission demands details be included beyond those offered by Colonel Roosevelt, but still the speaker’s essential goal is clear communication.

To develop cadets’ skill to communicate effectively in the written and spoken word, the Academy focuses its development of communication on four dimensions that are most relevant to the professional demands of an Air Force officer.

- *Content:* The ideas or arguments that represent the substance of the communication should be fully developed, well-reasoned, and well-supported.
- *Organization:* An organized presentation should have a logical flow. One point should lead clearly to the next.
- *Style:* The form of oral and written expression used is the most appropriate for the audience and occasion. The presenter should speak or write fluently, confidently,

be engaging and connect the officer and the audience. There should be a strong connection between the presenter and reader or listener.

- *Responding to the audience:* The need to “close the loop” by making certain that the listeners successfully understood the presentation. Questions and comments should be encouraged and then handled with confidence, respect and accuracy.

From their first days at the Academy, cadets are immersed in experiences intended to develop oral and written communication in both the training and educational aspects of the program. This starts at the base of the “Core Values Ramp” where an upper-class cadet sets the example by providing an oral presentation that is clear and concise on what it means to transition from the civilian to the military world.

As cadets progress through their four-year career, many achieve superior oral communication skills and represent the Academy at forums across the country. In the course of their four years at the Academy, the frequency, breadth and depth of oral communication called for provide each cadet with extraordinary opportunities for practicing and improving oral communication.

In addition, the era of electronic media has not diminished the importance of good written communication skills; if anything, it has reinforced the need to develop those skills. Electronic means have enabled a much faster method of transmitting and receiving administrative communication, taskings, reports, and directives. Especially because of that speed and convenience, it is essential to know the audience, to know and obey the conventional rules of spelling and grammar, and to polish an organized set of thoughts the writer wishes to communicate.

In addition to the intellectual value of good writing and speaking skills – a reflection of depth of thought, organization of ideas, and the capacity to express those ideas with power and even grace – written and oral communication are absolutely essential to officership. By presenting cadets with numerous opportunities to write and speak, giving them guidance and feedback on how best to handle content, organization, style, and audience response, they develop the poise, self confidence, and effectiveness necessary to serve as successful Air Force officers.



## Critical Thinking

*A Skills Outcome*

*“The simple but difficult arts of ... following an argument, detecting an ambiguity or a false inference ... cannot be taught in the air but only through the difficulties of a defined subject; they cannot be taught in one course in one year, but must be acquired gradually in dozens of connections.”*

*Jacques Barzun*

Critical thinking is one of the most desired skills academic institutions seek to develop in their graduates. It lies at the heart of intellectual activity. Critical thinking takes years to develop because it requires a certain level of academic maturity and development of higher level thought processes for students to change the way they think and evaluate information. After graduation, the critical thinking skills cadets developed while at the Air Force Academy enable them to assess information, make decisions, solve ill-defined problems and construct persuasive arguments in their role as military officers and educated citizens.

Definitions of critical thinking vary across academic disciplines and institutions. The Air Force Academy has approached critical thinking as a multi-step process used to analyze information and reach a sound conclusion. In parallel with this analysis is the construction of a well founded argument in support of the final conclusions.

- First, cadets must identify the underlying claim or issue. In introductory courses cadets are often guided to the key issues, but as they progress in academic maturity and military skill, they are challenged to identify and articulate issues on their own and explain the multidimensionality of complex problems. For



open-ended, real-world problems and original research, making strong connections and appreciating complexity is often the most challenging part of the process.

- Next, cadets as critical thinkers must examine and analyze available information. They judge data for its relevance and quality, while carefully identifying and articulating assumptions and potential biases. They examine an argument's logical progression, applying appropriate models. A critical thinker must also consider alternative perspectives and positions. If appropriate, these perspectives should be incorporated into their analysis.
- Finally, a critical thinker must draw conclusions and communicate them effectively. These conclusions should be supported by a sound, consistent argument that has been analyzed for its strengths and weaknesses. Additionally, the assumptions and limitations that were applied to frame the problem should be reassessed to determine the circumstances under which the conclusions are valid.

Critical thinking is employed in all of the academic, military, and athletic disciplines during a cadet's career. They practice this skill in different contexts and at deeper levels as they progress through the core curriculum, their major, and cadet co-curricular experiences.

For example, in natural science laboratory courses cadets conduct experiments, collect and analyze data, then apply scientific models of physical phenomena to answer questions about the natural world. Within the humanities and social sciences cadets research social, legal, political, economic, and military issues and learn to effectively express their ideas both orally and in writing. As expressed by Jacques Barzun in the quote that opens this section, critical thinking often requires a deep understanding and experience within a field of study. As a result, development of critical thinking skills is an area of intense focus as cadets progress through their academic major.

In addition to the academic arena, the challenges of leadership also require sound critical thinking skills. Cadets practice and hone their critical thinking by considering ethical issues of leadership in the Character and Leadership Development Program, then apply those skills and gain practical experience as they take on more and more responsibility for developing and leading their fellow cadets within the Cadet Wing and on the intercollegiate and intramural athletic fields.

Critical thinking is essential for military officers who must be able to quickly and accurately analyze information and articulate arguments. These abilities help an officer make sound decisions and convince others of the proper course of action. Every mission element of the Air Force Academy experience develops these skills in our cadets.



## Decision Making

### *A Skills Outcome*

Decision Making is the ability to effectively solve problems. It is crucially important because military service – and life itself – is full of decisions that arise every day in a multitude of contexts, great and small. Decision Making is absolutely vital to success as a military leader because leaders who cannot make sound, timely decisions cannot lead effectively.

In whatever the context and however important the decision – from deciding how best to motivate one's Airmen to deciding the type of munitions to employ to engage a particular target – the process of Decision Making is similar.

Cadets must develop the skills required to identify the issue to be decided, filter known information and facts with unknown data and assumptions, view possible alternatives, generate a list of viable solutions, and make a timely and sound decision based on the key objectives and institutional values.

To enable cadets to develop these skills, Decision Making is interwoven throughout a cadet's life. Indeed, every action by a cadet is a reflection of that cadet's choice or decision. From the moment that new cadets first arrive in the Cadet Area, they are under the watchful eye of upperclassmen, Air Force cadre, faculty, and coaches, all of whom provide formal or informal feedback. The opportunity for more formal feedback on Decision Making increases as upper-class cadets gain higher leadership positions under the Academy's Officer Development System.

The ability to make a good decision in one academic, military or athletic context may not translate into the same ability in a different context, much less to a “real-life” personal or leadership decision, even though the decision making processes are similar. To teach cadets how to adapt to this, Decision Making is taught in a variety of academic, military and athletic contexts. Every course that teaches cadets how to solve problems within that discipline is also teaching cadets how to make decisions. Core academic courses in engineering, management, electrical and computer engineering, astronautical engineering, political science, law, chemistry, and economics have similar decision making and problem solving activities.

Decision Making is also taught and evaluated by the Athletic Department in such core physical education courses as boxing, self-defense, and unarmed combat. Decisions made in these courses, although made very quickly under duress, use a similar decision making process as those in the classroom and throughout a cadet’s daily routine. And while not taught in such a formal way, Decision Making is also a vital part of experiences in their cadet squadrons and their varied airmanship programs.

Developing cadets’ skill in effective Decision Making is essential to their preparation as future officers, because without the ability to make effective decisions, they will not lead effectively.

## Stamina

### *A Skills Outcome*

*“You gain strength, courage, and confidence by every experience in which you really stop to look fear in the face. You are able to say ‘I lived through this horror. I can take the next thing that comes along’ ... You must do the thing you think you cannot do.”*

*Eleanor Roosevelt*

Stamina – the capability of sustaining prolonged stressful effort, or the mental and physical ability to persist with focus and intensity even when faced with adversity. Stamina has always been a necessary quality of any effective warrior. The demands of current and future military service, both in peace and wartime, require robust leaders of character who clearly have the capacity to lead from the front in the most austere and dangerous conditions imaginable for prolonged periods of time in dynamic situations that encompass the full spectrum of military operations.

When faced with prolonged adversity, a lack of Stamina may lead to weakened resolve and failure to complete the mission. Therefore, Stamina training programs must be at the very heart of overall service academy training and curriculum. These programs must not only test and measure, but develop, mold and enhance the Stamina of cadets.

The Air Force requires an officer to “lead courageously.” To do so, Air Force officers must be able to persist with focus and intensity even when faced with adversity and fatigue. Every officer is expected to maintain the physical fitness and mental perseverance to maintain exceptional performance during times of duress.



The human characteristic of Stamina is necessary in both the physical and mental realms.

- *Physical stamina:* also known as *endurance*, physical stamina is the ability to exert the body for relatively extended periods of time, both anaerobically and aerobically. This requires a physical body that is conditioned and has the skeletal and muscular strength and overall physiological health to execute requisite motor skills.
- *Mental stamina:* the individual’s ability to persist and maintain emotional control and sharp mental faculty when placed in stressful situations. Prime examples include the mental and emotional fortitude required to effectively engage the enemy despite the fear of injury or death, and to survive for extended periods of time as a prisoner of war.

To help cadets develop the stamina necessary to be effective leaders, the Academy focuses stamina development and assessment in both the physical and mental realms. The Academy’s integrated curriculum addresses stamina development by ensuring each cadet develops a personal commitment to lifelong physical fitness, develops mental toughness, perseverance, and confidence to overcome adversity, and is dedicated to combat effectiveness.

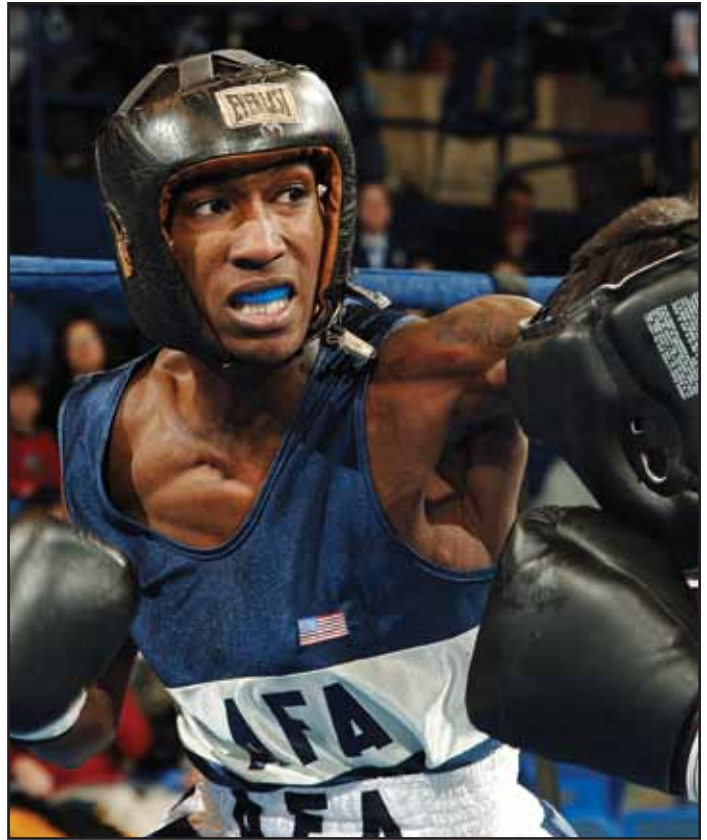


Immediately upon entering the Academy, cadets are immersed in myriad experiences intended to test and develop their stamina in each of the above listed areas. From In-processing Day through graduation, stamina is required to meet the minimum standards required by each mission element, and in the process of doing so, stamina in each individual cadet is systematically enhanced.

Physical stamina is developed throughout the entire four-year experience through mandatory physical education classes and also mandatory competitive athletics, whether intercollegiate or intramural athletics.

Mental stamina is developed throughout the entire four-year experience as well. Experiences include the First Year Experience, Basic Cadet Training, Commandant's Challenge, Recognition, and simply following the demanding daily schedule of calls ... all of which must be successfully accomplished to meet graduation requirements.

Stamina is a necessary characteristic for all military members, but absolutely critical for the demands of military leadership. By imposing a vigorous, challenging curriculum and training program, the Academy ensures that its graduates have developed, demonstrated and internalized the Stamina necessary to be effective leaders of character for the nation.



## Courage

*A Skills Outcome*

*"Courage is rightly esteemed the first of human qualities ... because it is the quality which guarantees all others."*

*Winston Churchill*

At the Air Force Academy, courage is having the moral, physical, and mental ability to act in the face of adversity. Courage is shown by the grit to get through Basic Cadet Training. It is shown by the mental toughness to concentrate on tasks associated with a full course load. It is confirmed when cadets jump out of an airplane or jump off the 10-meter diving board. Courage is alive when cadets do not tolerate lapses in integrity or performance by others.

Courage is essential to the profession of arms. When life and limb are on the line, it takes physical, mental and moral courage to win the day. Even the hectic everyday Academy life can require courage to carry on. An intrinsic ability to put the mission and others before one's self and do the right thing, even at an increased personal risk, is the essence of this Outcome.

We focus on three aspects of Courage at the Air Force Academy: *moral courage*, *physical courage*, and *mental courage*.

- *Moral courage* is acting with integrity when confronted with adverse or adversarial situations. The Academy defines character as: one's moral compass – the sum of those qualities of moral excellence, that moves a person to do the right thing despite pressures to the contrary.



In this sense, the compass guides cadets to do what is right and *moral courage* enables them to act on that guidance.

- *Physical courage* is overcoming physical obstacles, especially when threatened and vulnerable. When cadets are outside their comfort zones, we teach them to use judgment to accept a degree of risk, trust in their team and training, and to use physical courage to act.
- *Mental courage* is maintaining composure and the ability to concentrate in stressful environments. It's developing the skills of critical thinking and decision making to such a high degree that when presented with problems that require cadets to commit themselves and others to assume risks, cadets commit (i.e. take that action) and learn to succeed.

Developing Courage involves exposure to many different situations where cadets must decide and act. From their first day at the Academy, cadets are intentionally immersed in experiences to develop Courage. Getting on the bus on In-processing Day is the very first step toward learning and adopting the Courage to persevere. From Basic Cadet Training to leading the Wing, cadets are constantly faced with situations involving moral, physical, and mental courage. Cadets exemplify Courage when they internalize and enact the Honor Code to its full spirit and intent – when they live honorably, and do not lie, steal, cheat or tolerate such behaviors – and then they stand up for what is right despite social pressures. Examples of mental courage are evident as cadets take full course loads while maintaining focus and excelling throughout the mentally and physically demanding military training programs of Recognition, Commandant's Challenge, Global Engagement, Combat Survival Training, Unarmed Combat and Water Survival. Courage is the ability to act and lead positively when adversity lurks and danger threatens. We strive to make our cadets unshakable leaders who others know they can count on to help the entire team succeed.



## Discipline

*A Skills Outcome*

*“The discipline which makes the soldiers of a free country reliable in battle is not to be gained by harsh or tyrannical treatment. On the contrary, such treatment is far more likely to destroy than to make an army. It is possible to impart instruction and give commands in such a manner and such a tone of voice as to inspire in the soldier no feeling but an intense desire to obey, while the opposite manner and tone of voice cannot fail to excite strong resentment and a desire to disobey.”*

*Maj. Gen. John M. Schofield, U.S. Army  
from his address to the graduating class of West Point, 1879*

General Schofield's quotation on discipline has been memorized by Fourth-class cadets since the Academy's inception. It points both to the need for discipline in military organizations and to the manner discipline is best instilled. But what is Discipline? It's been defined in many ways:

- The results of training that corrects, molds, or perfects the mental faculties or moral character.
- Orderly or prescribed conduct or pattern of behavior.
- Restraint exercised over one's own impulses, emotions or desires.

Discipline is a critical component to the development of military officers, and professional obedience is a key warrior and airman skill. The Academy thinks about Discipline in two subtly different ways. First, cadets live in a highly disciplined environment.

From their very first day at the Academy, Basic Cadets are presented with myriad requirements to conform to specific standards: in their dress, in their posture, in their manner of conversing with others, in their manner of proceeding from one place to another, in their assignment to particular units, in their participation in diverse mandatory activities, etc. After Basic Cadet Training, cadets gain progressively more discretionary control over their lives – but always, within an environment involving considerably more imposed standards of discipline and performance than at virtually any other college or university.



Second, we also think about Discipline as the extent to which the Academy's diverse challenges contribute to the development of self-discipline among cadets. As cadets progress through their four years at the Academy, their academic, athletic, airmanship, and military training experiences, including summer training programs, present unequaled opportunities to understand, practice and internalize discipline as a key warrior skill.

For example, a rigorous academic program requires cadets to develop the self-discipline to master time management skills and apply themselves in a focused manner; making choices along the way that demonstrate self-mastery. Participation in athletic competitions and physical education classes offer cadets the chance to build the discipline to maintain a professional and sportsmanlike bearing while under physically demanding conditions. Daily life in a cadet squadron provides cadets with infinite opportunities to develop leadership and discipline both in themselves and their fellow cadets. Participation in parades, inspections, various sorts of inter-squadron competitions, all provide opportunities to both demonstrate Discipline and, equally important, to *develop* Discipline.

Discipline is a Warrior and Airman skill that will serve our graduates, our Air Force, and our nation well in times of danger and peace.



## Teamwork

### *A Skills Outcome*

Definitions of teamwork abound in our society, but all get at the same fundamental idea: a group of individuals working together to achieve a common goal is better than the collective performance of the individuals. Government agencies, corporations, and the military desperately seek to increase the synergy and effectiveness of their organizations by increasing teamwork. Teamwork, a core competency of the military, has always been essential to military success and to the success of the Air Force Academy.

As future military officers, Academy cadets have committed to be part of something bigger than themselves. They are expected to work together on teams to advance the goals of that team, sometimes at the expense of their personal goals. The Air Force calls this "Service Before Self." More than most professions, the military demands a high degree of proficiency in many aspects of teamwork, from accepting unit objectives as one's own and developing teams of personnel with diverse skill sets to accomplish those missions or goals. Military officers must be able to understand and perform their roles as followers and leaders, and they are often required to alternate between these roles. Formal leadership based on rank or position and informal leadership based on specific skills and talents may require an officer to perform both roles on the same team. Air Force leaders must be able to capitalize on the abilities to build a team around a common mission to achieve organizational success. Teamwork is an Academy warrior skill that empowers our graduates to succeed. Therefore, a goal of the Academy is to commission officers who embody the following qualities:

- *Commitment to team goals* – If truly committed to team goals, team members ensure the goals are shared and understood by all team members.
- *Inspires and empowers others* to complete their share of team responsibilities and assist others with their responsibilities, while inspiring members of the team to achieve high levels of performance. Inspiring and empowering others includes ensuring all members of the team contribute in constructive ways.





- *Holds self and others accountable* – teamwork ensures each member holds him or herself and other members to the high standards of performance required for military organizations.
- *Builds trust and a positive environment* to ensure other team members feel comfortable asking questions, providing inputs, and seeking assistance. Trust creates a climate of openness and mutual support to help teams reach maximum performance.

From their first days at the Academy, cadets are immersed in experiences that develop teamwork. During the six weeks of Basic Cadet Training, basic cadets quickly discover how teamwork with their classmates helps them succeed in the challenges they face. The Officer Development System specifically recognizes the value of teamwork with the incorporation of it into the systematic process of Personal-Interpersonal-Teamwork-Organization model. Throughout the rest of their four years during the “academic year,” cadets live in dormitories organized in groups, squadrons, flights, and elements and practice leadership and teamwork on a daily basis.

Additionally, cadets are organized into small teams to work on projects for a variety of academic courses, helping develop teamwork skills. An example is their introductory engineering course where they are placed in teams of four to design and build rockets, gliders, and bridges. Teamwork also evokes thoughts and images of competitive sports, and cadets participate in a variety of competitive athletics. Whether as an NCAA intercollegiate athlete, club sport competitor or participant in intramurals, cadets see first-hand how teamwork makes them more successful. From being a new team member to serving as team captains, they are able to practice teamwork and take valuable lessons with them upon graduation.

General Douglas MacArthur said, “Upon the fields of friendly strife are sown the seeds that upon other days and other fields will bear the fruits of victory.” This quotation describes how teamwork on athletic fields can translate into military success.

Teamwork is a critical skill for Academy cadets and they develop teamwork skills throughout their Academy experience. Without such skills, no military unit can be successful.







## Heritage and Application of Air, Space and Cyberspace Power

### Knowledge Outcomes

#### *A Knowledge Outcome*

*Much of every cadet's curriculum is devoted to what the Academy calls "the Core" – a required set of courses distributed across the Basic Sciences, Engineering, Social Sciences and Humanities. There also are core experiences in physical education, military training, airmanship, and character development. The size of our core curriculum is unique among colleges and universities, and has been a defining element of the Academy from our first graduating class. Our Knowledge Outcomes define the general characteristics of the essential knowledge all cadets must learn in addition to discipline-specific knowledge they gain through an academic major.*

The Heritage Outcome expresses the fundamental sentiment of the Air Force's mission: to "fly, fight and win in Air, Space, and Cyberspace." Faced by a 21<sup>st</sup> century world of daunting and increasing complexity, marked by the threats of terrorism, economic globalization, competition for scarce resources, climate variation and rapid technological change, contemporary Air Force officers must become intellectually adept in areas much broader than their predecessors of just a few years ago. All Academy graduates must become advocates of air, space and cyberspace power. Graduates must appreciate the proud legacy of the Air Force and what it means when one puts on an Air Force uniform.

In developing and assessing Heritage and Application of Air, Space and Cyberspace Power, we focus our educational and training experiences on six aspects of this Outcome, all of which capture specific attributes or competencies most appropriate to the Air Force Academy's mission.

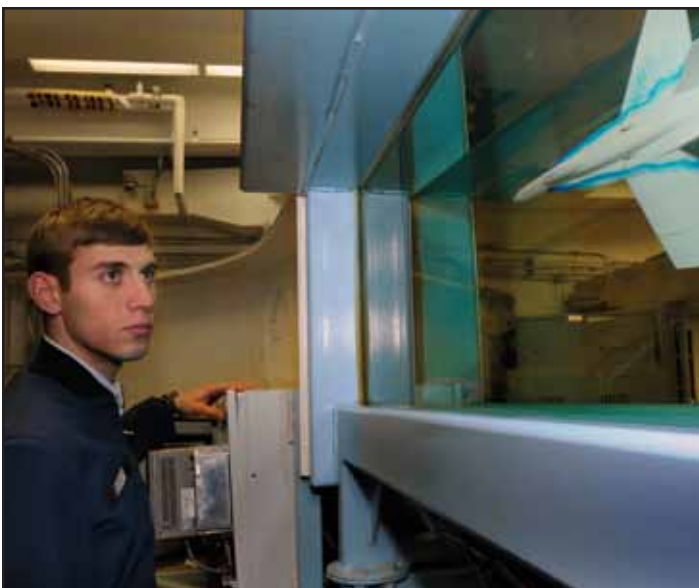
- *History of air, space and cyberspace power and their impact on contemporary military operations* focuses on the strategic theory's evolution, as well as the connections between past and present military campaigns.
- *The U.S. Air Force mission, vision and competencies* are critical knowledge sets for all Air Force leaders today. Air Force officers must understand how their service contributes to the defense of the nation.
- *Unique capabilities and limitations of air, space and cyberspace operations* reveal a knowledge area where Air Force officers must know and understand their environment to be effective.
- *Capabilities of Air Force components across air, space and cyberspace and innovative use of those capabilities to accomplish missions* provide our cadets the opportunity to explore the Air Force's organizational architecture.
- *Operational environments of air, space and cyberspace power and their integration in military operations* are important knowledge areas that deal with the application of combat power. Understanding the historical and current roles of technology, leadership, logistics and geography and how they effect change and continuity in warfare will greatly enhance the ability of Air Force leaders to deal with future challenges in military operations.
- *Applying doctrine, concepts, organizations and capabilities* refers to knowledge of past and present doctrine and theory and how these aspects apply to warfighting domains. Air Force officers must understand the levels of conflict – tactical, operational, and strategic – and how the elements of military art and science guide the employment of air, space and cyberspace power.



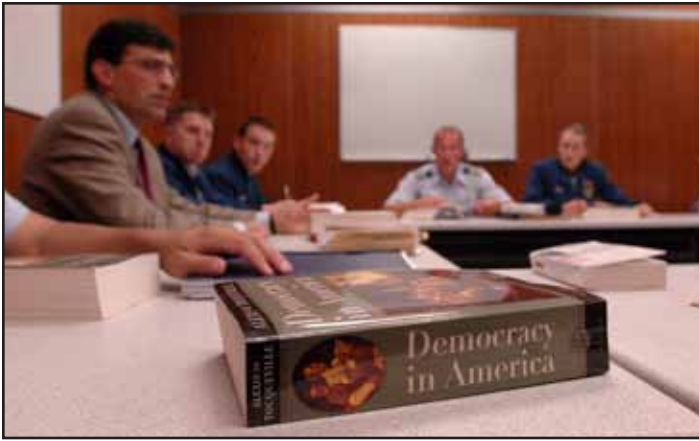
Much of the understanding of Air Force history and heritage comes from required education and training experiences offered by the Dean of the Faculty and Commandant of Cadets. In the core military history course, cadets investigate in detail the evolution of America's air arm and its contributions to fighting three 20<sup>th</sup> century wars. In Introduction to Military History, cadets explore the contribution of space power to the Cold War and the vital contribution of information warfare to military operations, both before and after the computer age. Their first course in Military Strategic Studies provides the theoretical basis for warfighting by delving into the development of strategic thought from ancient China to the present. In addition, Basic Cadet Training features lessons and evening presentations that explore the heritage of the Air Force. These experiences provide the historical context and chronological depth necessary for graduates to understand forces shaping today's Air Force.

Five required engineering courses firmly ground our cadets in the technical aspects of air, space and cyberspace power. For example, our Fundamentals of Aeronautics course provides cadets with the background to understand aircraft mission-driven design and performance limitations. These two key areas provide our graduates with valuable insight for future career fields—including operations, engineering, intelligence, and acquisition—while at the same time providing the means to understand airpower application constraints such as range, payload and speed. Likewise, our introductory course in computer sciences helps cadets understand the fundamental characteristics of information assurance and computer security and identifies software and hardware useful to secure and attack cyberspace systems.

Furthermore, it's not all classroom or lab work: cadets spend three weeks at Air Force installations around the world during Operation Air Force, a summer program that exposes cadets to current applications of air, space and cyberspace power. The ability to connect our Air Force's history and heritage to present and future operations will likewise enhance graduates' ability to wrestle with issues they will face each day. Ultimately, their understanding of the Heritage and Application of Air, Space and Cyberspace Power Outcome will help them "fly, fight and win in Air, Space, and Cyberspace."







## National Security and the Full Spectrum of Joint and Coalition Warfare

### *A Knowledge Outcome*

The Air Force Academy produces military officers who have taken an oath to “support and defend the Constitution of the United States against all enemies ...” Their character and knowledge are critical to defending the national security of our country. As both an institution of higher learning and a professional military school, instructors in every course offered at the Academy draw links between specific disciplines and the requirements of national security. This makes the Academy unique, providing cadets with both the knowledge and motivation to effectively defend the security of the United States.

Our cadets will enter a national security environment characterized by complexity, ambiguity and uncertainty. We cannot prepare cadets for every specific challenge they are likely to face as officers. Accordingly, our national security courses aim to educate cadets broadly to develop versatile and creative thinkers who can respond effectively to the demands of the evolving 21<sup>st</sup> century security environment. By laying a broad foundation in the theories and methodologies of the basic sciences, engineering, economics, geography, history, political science, and military strategic studies, we equip cadets with the ability to think in technological and strategic terms to ensure the security of the United States.

To develop an understanding of national security among our cadets, we focus our development on five areas that are particularly important to national security.

- The *Constitution* is the basis for national security. The Officer Development System notes, “Officers serve the Nation for one and only one purpose: to support and defend the Constitution.” An understanding of the Constitution and American system of government provides cadets with the motivation to secure our nation and an understanding of how national security policy is made.
- *Appreciating the heritage* of the U.S. military gives cadets an understanding of the unique circumstances that

have shaped the American military tradition and the behavioral standards of conduct for military personnel. More broadly, it also provides cadets an understanding of how historical events have shaped today’s world, enabling cadets to better tackle national security challenges.

- Understanding the *full spectrum* of conflict prepares our cadets to carry out a wide range of missions, including peace-keeping, irregular warfare, conventional warfare, and nuclear warfare. Accordingly, officers must comprehend the strategic, operational, and tactical levels of war and how they relate to each other in a wide variety of environments.
- Cadets must be able to comprehend, analyze, and explain the current security environment, joint and coalition military capabilities, and the operational environments in which joint and coalition operations are planned, organized, and executed. More specifically, cadets must be able to understand, assess, and explain the *doctrine, organization, and command of joint and coalition forces*. This includes the synergistic relationships among sea, land, and air forces, the complexities of organizing and executing joint and coalition operations, and the effectiveness of such integrated operations in meeting national and coalition objectives.
- The *complexity* of national security issues means that cadets must understand the culture, economic system, geography, history, politics, and technical capabilities of the United States, our allies, and adversaries to best use our resources to ensure national security.

National Security and the Full Spectrum of Joint and Coalition Warfare is at the very core of the knowledge expected of military officers. The Academy provides a diverse curriculum that prepares cadets for the breadth of future national security challenges. It emphasizes the diversity of diplomatic, economic, informational, and military tools used to ensure national security while ensuring that cadets are prepared to take their place as Air Force officers committed to defending the Constitution. Moreover, the Academy utilizes numerous learning experiences to develop this Outcome. These include class presentations, debates, research papers, and the opportunity to apply military theories and doctrines through team-based exercises in air warfare, warfare simulation, and space operations labs.





- The humanities and social sciences, as a foundation for strategic and adaptive thinking.

Cadets are exposed to cultural factors in the study of history, languages, literature, economics, geography, philosophy, and management. The sequence of learning builds directly on the cultural appreciation learned in the core curriculum as students apply their knowledge of cultural factors in both theoretical and practical problems.

From their first days at the Academy cadets are immersed in historical and language study to develop awareness of Civic, Cultural and International Environments. In their Fourth-class year, for example, they are enrolled in both World History and Language Studies. The world history course develops a comprehension of how historical events in certain regions of the world impact viewpoints regarding international relations. In addition, the study of foreign cultures, evolution of technology and military heritage can directly relate to many duty situations. This historical knowledge, combined with their foreign language skills is invaluable to any future Air Force officer.

As another example, in their Third-class year all cadets take an academic course called Literature and Intermediate Composition. In addition to traditional classroom assignments and instruction during the course, students use a variety of texts, including literary, cinematic, historical, domestic and foreign ones, to learn how historical and fictional contexts reveal values of diverse cultural and international environments. In their First-class year, cadets analyze literary works and accomplish related writing/speaking assignments to consider the emotional, moral and psychological aspects of war and their effect on society and culture.

We are preparing our future leaders to participate in joint and coalition environments by empowering them to see the world from an ethical, economic and geopolitical perspective. Cadets use different methodologies to show concrete examples of how national cultures impact operations. Learning is reinforced with scenarios taken from current affairs on how to comprehend information, analysis, and opinion on geopolitical issues from a cultural and historical perspective in major countries and crisis areas around the globe.

By studying other cultures, cadets learn to recognize individual and cultural differences, allowing them to improve their comprehension and interaction within the international system. The Civic, Cultural and International Environments Outcome allows cadets to appreciate how different languages, religions, cultures and institutions, balanced by ethical principles and Air Force core values, affect military operations. This appreciation, combined with a comprehension of how historical events have produced today's world in terms of diffusion and interaction of nations, people, groups, and ideas, is critical to developing leaders of character.

## Civic, Cultural and International Environments

### *A Knowledge Outcome*

Cultural awareness, knowledge, and competence are fundamental to the education of Air Force leaders. The value of understanding cultural factors in a multinational deployment environment is critical to the success of Air Force operations. This understanding fosters a healthy command/work environment, and increases the effectiveness and efficiency of joint and multinational operations.

Air Force Academy cadets are preparing to lead in the 21<sup>st</sup> century by gaining knowledge and understanding of:

- Traditional and contemporary perspectives of human leadership, organizational behavior, and their effect on societies and cultures;
- Western and non-Western cultures and traditions, and their effects on unit, national and international affairs;
- How global issues influence legal, defense, domestic and foreign policy;
- How Air Force actions have global consequences; and





## Ethics and the Foundations of Character

*A Knowledge Outcome*

Nothing is more important to success as a military officer than good character. To many people in our own country and around the world, officers are the face of our nation; they develop and then execute policies on the employment of military forces. Air Force officers are responsible for safeguarding freedom, protecting the lives of their subordinates, and when they must, sending those same subordinates into mortal danger; doing all this within the bounds of morality demands extraordinarily sophisticated judgment and unflinching strength of conviction.

Developing the qualities of character required to be a good military officer is not easy. Many things must contribute to the cadet's development if they are to achieve the required competence. Ethics and character are strengthened by:

- Deep knowledge of the nature of morality and its purposes;
- An understanding of the basic principles that bind us as human beings, citizens, and members of a profession;
- Practice in the art of making moral judgments in both hard and easy cases;
- The settled motivation to act reliably on the deliverances of good judgment.

Providing this knowledge and “know how” is the lofty aim of the Ethics and the Foundations of Character Outcome.

Cadets pursue developing good character in a variety of ways. In their Second-class core course in philosophy, they undertake academic study of moral experience and the works of the classic moral philosophers; become thoroughly familiar with the Just War Theory; and grapple with the theory behind the complex commitments and demands of being a professional military officer. In their Third-class core course in law, cadets master the Law of Armed Conflict, underscoring the legal dimension

of these moral obligations. And when it comes to developing moral judgment, they practice, practice, practice: with case studies across multiple disciplines, by immersing themselves in morally challenging literature; in the daily demands of their real lives in classrooms, in the squadrons, on athletic fields, through clubs and in special military programs. The First-class year provides special opportunities, including the real moral decisions they must make in wing leadership positions and day-long, off-site participation in the capstone Academy Character Enrichment Seminar.

## Principles of Science and the Scientific Method

*A Knowledge Outcome*

Education is based on a principle of “building-up,” where one learns fundamental concepts to move on to ever-higher levels of learning and application. The Principles of Science and the Scientific Method Outcome at the Air Force Academy is founded on this idea. Basic science courses, consisting of mathematics, physics, chemistry, biology, and computer science, as well as a behavioral science course in the scientific study of human behavior and mental processes, provide cadets with fundamental knowledge that will be incorporated later in their core curriculum as well as in their respective majors.

Without electricity and magnetism fundamentals, an electrical engineer could not properly design circuits or control systems. Without understanding the periodic table and properties of the elements, a structural engineer could not understand strengths of materials. Air Force physicians could not realize the basic operations of the human body or genetics without courses in biology. Underlying and common to all sciences, is mathematics. The operations and manipulations must be known and understood by the student to problem-solve within these scientific and engineering disciplines.

Similarly, the scientific method has a long history and is foundational to experimentation and basic inquiry. Scientists ask questions such as, “Why does this event occur? Can I explain this phenomenon? Can one predict an outcome based on previous experimentation?” These are all questions that have been asked over thousands of years. The scientific method has been used in some form or fashion during this time to improve humankind's knowledge about and understanding of the world around us.

The scientific method is not a recipe: it requires intelligence, imagination, and creativity as described by Einstein and Leopold in 1938. These are all traits of great military officers, and therefore Academy graduates must be able to call on these same qualities and their familiarity with diverse scientific disciplines to support the mission of the Air Force. For example, principles of science and the scientific method are frequently used by officers in research and development, program management, operational analysis, intelligence, medical, and even flying and maintenance communities. In a more general sense, *all* officers will find themselves facing complex decisions requiring an appreciation of the principles of science and the scientific method.

Learning experiences in basic science courses provide cadets with a wide variety of opportunities to build their knowledge of scientific principles and the scientific method. In introductory physics, for example, cadets learn basic principles of projectile motion – an area of obvious importance to the Air Force when one considers the importance of accurately delivering bombs on target – through their study of one and two dimensional kinematics and of freefall (motion under the influence of gravity). This is a rewarding, kinesthetic, and engaging lesson in the power of the scientific method.

In sum, through a wide variety of courses and instructional methods cadets learn to: exhibit knowledge of the principles of mathematics and diverse domains of the sciences as the foundation for leveraging technology and applying air, space and cyberspace power in the 21<sup>st</sup> century; appreciate the scientific method as a basis of critical thinking, effective problem solving, leadership, and decision making in our technology-rich Air Force; and recognize the limited ability of science to address questions of ethics, values, and unnatural phenomena.

## **Principles of Engineering and the Application of Technology**

### *A Knowledge Outcome*

Engineering is the application of the principles of science toward satisfying a need. Engineering teaches cadets to apply basic knowledge of the physical world to construct objects or technology that can serve to improve lives, achieve the Air Force mission, enhance the nation's quality of life and advance the progress of mankind. An educated individual and highly skilled officer confronts those problems not only from a social perspective, but with a broad understanding of the opportunities and constraints imposed by the physical workings of the universe.

The Air Force prides itself as the nation's premier service in terms of leveraging high-technology and leading-edge engineering to accomplish its mission with remarkable effect. On the heels of graduation, our young officers will fully recognize the technical challenges of their service's mission and the physical capabilities and limits within their assigned career fields and weapon systems. The nation's trust is in these officers to be "operators," and experts in the technology and the principles that are at work and to devise enhanced capability that is essential to the actual survival of the nation. In essence, we ask all officers to be architects of operational art and capability; that skill is founded in part on the application of scientific and technological principles.

Air Force officers must solve challenges such as prematurely failing aircraft, the implications of biosynthetic fuel use, increased demand on limited satellite communications capability, oversight of vendor-designed software that does not deliver the desired value-added, new opponent capability that trumps stealth, and cyber threats that attempt to disconnect us from our networks. These challenges



demand a broad educational experience in both the underlying sciences and the application of those principles against challenges in a number of separate domains (air, space and cyberspace).

Understanding the Principles of Engineering and the Application of Technology means to exhibit knowledge of the following:

- A number of engineering disciplines as a foundation for leadership, problem solving, critical thinking and decision making in our technology-rich Air Force;
- How engineering principles are applied to air, space and cyberspace operations;
- The systems approach as a basis for framing and resolving complex problems in operational environments;
- Ethical implications and unintended effects associated with the application and methods of science and technology; and
- Techniques and processes that cultivate innovation and the solving of ill-defined problems.



Development of this engineering-based problem solving and decision making is deliberately accomplished through a four-year progression of courses, projects, programs and cadet experiences that provide a number of tools and methods such as the “Engineering Method” and the “Decision Matrix,” progressively expanding the application of these tools to more and more complex systems.

Engineering nurtures a “systems approach as a basis for framing and resolving complex problems” through a deliberate four-year progression of courses and projects providing content and process spiraling developmentally from algorithm and component knowledge through subsystem-level understanding and then to a system-of-systems perspective. This provides each cadet the knowledge and skill to comprehend the capacity and limitations of complex systems by understanding the same at each level of the system and those inherent with the system’s interfaces and interactions.

The 1950 Stearns-Eisenhower Report, a founding document for the formation of the Air Force Academy, considered it essential that Service Academy graduates have comparable educational backgrounds to graduates of other leading universities, and that their education include the arts and sciences in addition to professional military subjects. In addition, the report called for particular attention at the Academies to courses in science and engineering. As a result, the Air Force Academy boasts 50 years of teaching cadets to understand and solve engineering problems. Each one of our cadets will, as a minimum, develop a fundamental understanding of the capabilities and limitations inherent within the fields of computer, electrical, mechanical, civil, aeronautical and astronautical engineering; each cadet builds from a component-level understanding to a systems-level comprehension prior to graduating. We are teaching Academy cadets to apply basic knowledge of the physical world toward building capability and technology for the Air Force, one officer at a time.





## SECTION III

### CONCLUSION

The USAFA Outcomes represent our shared vision of the characteristics our cadets must have by the time they graduate. They describe the responsibilities, the skills and the knowledge that we seek to instill in every cadet through a challenging four-year course of instruction culminating in the dual end goals of a Bachelor of Science degree and commission as a Second Lieutenant in the U.S. Air Force.

Of course, ensuring that the Academy is providing the best possible course of instruction is a never-ending challenge. The Academy continuously assesses how effectively the Outcomes are being developed in cadets and regularly makes ongoing improvements to the course of instruction.

Much of the responsibility for this ongoing process of assessment and curricular improvement falls to the Outcome Teams, which were mentioned earlier. The Outcome Teams play three closely related roles in promoting development of their respective Outcomes. First, they represent our institutional expertise about the Outcome. Team members' educational and professional backgrounds make them uniquely qualified to guide cadet development in those areas.

Within their teams, they use their expertise to make connections – spanning across the institution – between the different courses, programs, and cadets' experiences.

The second role of our Outcome Teams is institutional stewardship. Each team is responsible for overseeing the Academy's endeavors to assess cadets' accomplishment of their Outcome. Are cadets demonstrating critical thinking at the levels we would expect? Are they treating one another with respect for human dignity? Are they building the knowledge necessary to become an officer of character? If not, how can the Academy improve in areas where cadets might be falling short? These are the kinds of questions the teams are asked to confront.

The final role of the Outcome Teams is one of institutional ambassadorship. Put simply, the Outcome Teams are spokespersons for their Outcome, both within and outside the institution.

These Outcome Teams, along with all of the faculty and staff at the Air Force Academy, take pride in the fact that when each new class of graduates enters the US Air Force, the new Lieutenants will have had the appropriate balance of military, academic, athletic, and airmanship as well as character and leadership experiences to set them up for success while serving their nation and fulfilling the Airman's Creed.



# Airman's Creed

I AM AN AMERICAN AIRMAN.

I AM A WARRIOR.

I HAVE ANSWERED MY NATION'S CALL.

I AM AN AMERICAN AIRMAN.

MY MISSION IS TO FLY, FIGHT, AND WIN.

I AM FAITHFUL TO A PROUD HERITAGE,

A TRADITION OF HONOR,

AND A LEGACY OF VALOR.

I AM AN AMERICAN AIRMAN,

GUARDIAN OF FREEDOM AND JUSTICE,

MY NATION'S SWORD AND SHIELD,

ITS SENTRY AND AVENGER.

I DEFEND MY COUNTRY WITH MY LIFE.

I AM AN AMERICAN AIRMAN:

WINGMAN, LEADER, WARRIOR.

I WILL NEVER LEAVE AN AIRMAN BEHIND,

I WILL NEVER FALTER,

AND I WILL NOT FAIL.

USAF ACADEMY

**OUTCOMES**

---