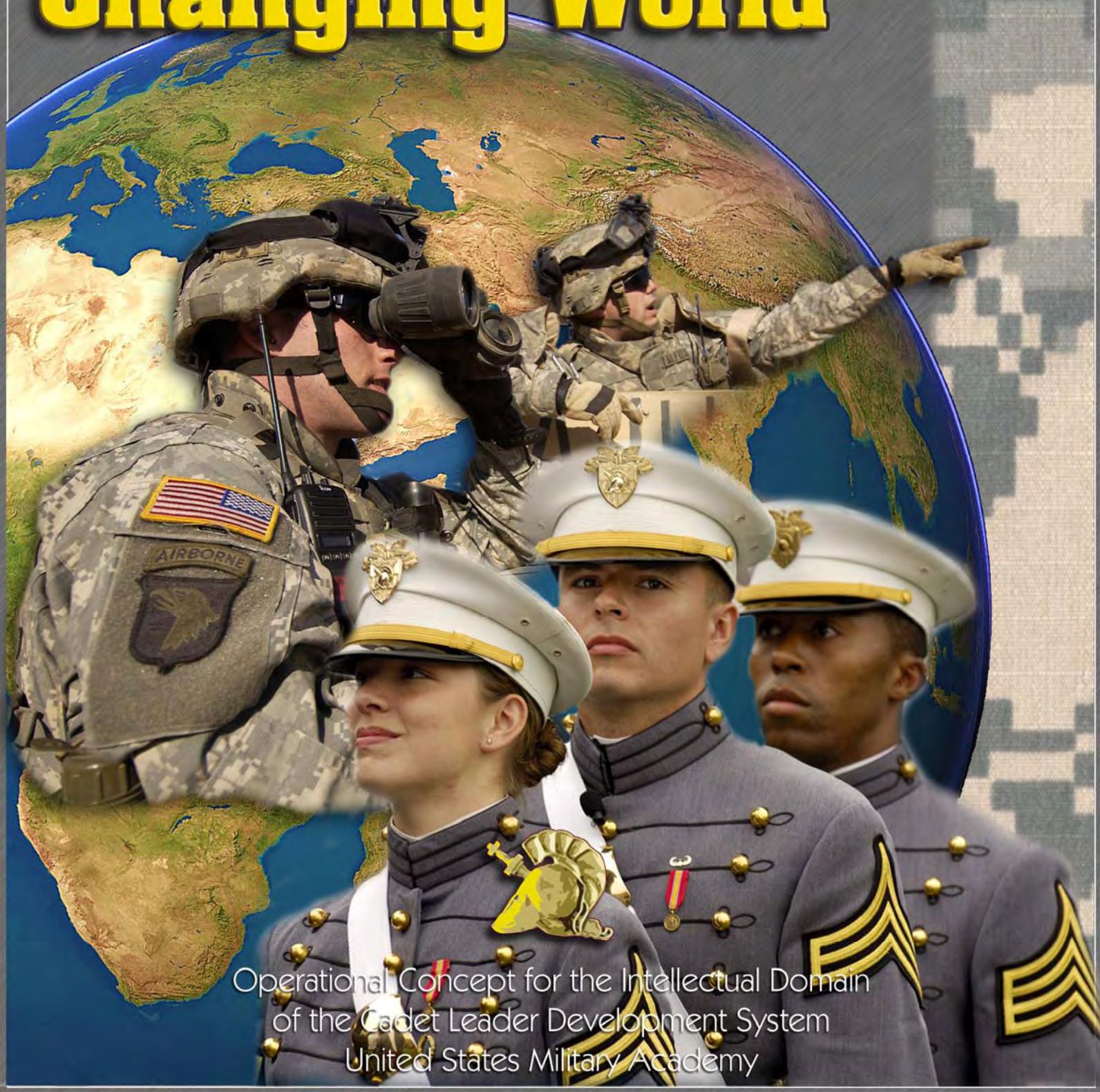


Educating Future Army Officers for a Changing World



Operational Concept for the Intellectual Domain
of the Cadet Leader Development System
United States Military Academy

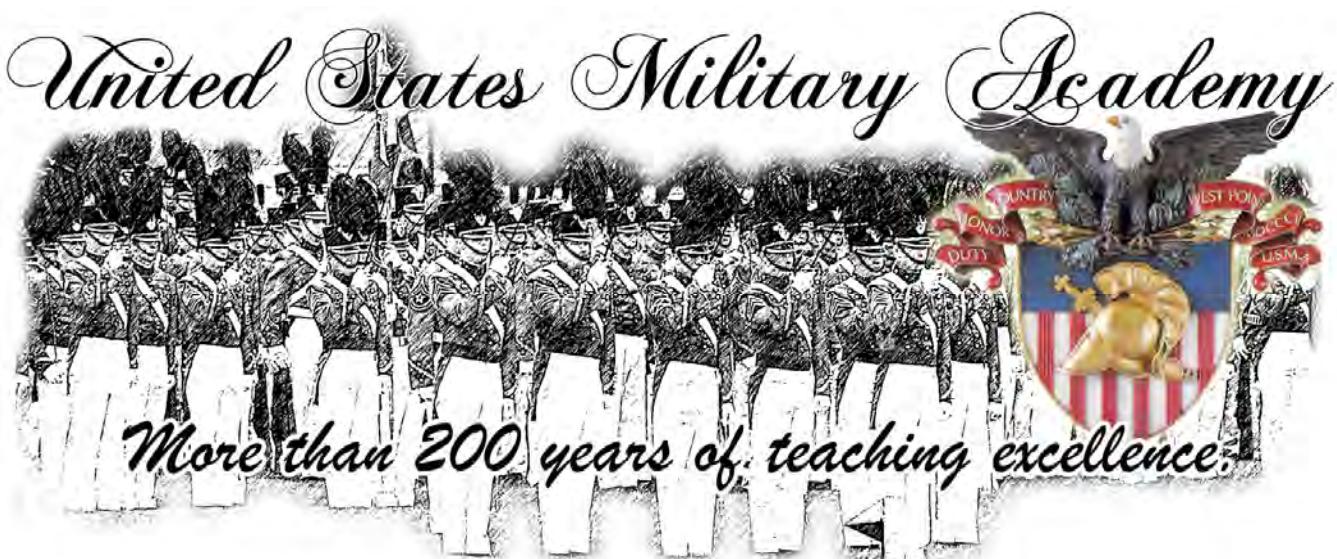
The United States Military Academy prepares young men and women to be commissioned officers and leaders of character for service to the nation.



Upon graduation, West Point cadets are commissioned as 2nd Lieutenants in the U.S. Army. Small class sizes, a professional faculty, and a rigorous, general education curriculum provide cadets with the intellectual foundation necessary for successful service as Army Officers.

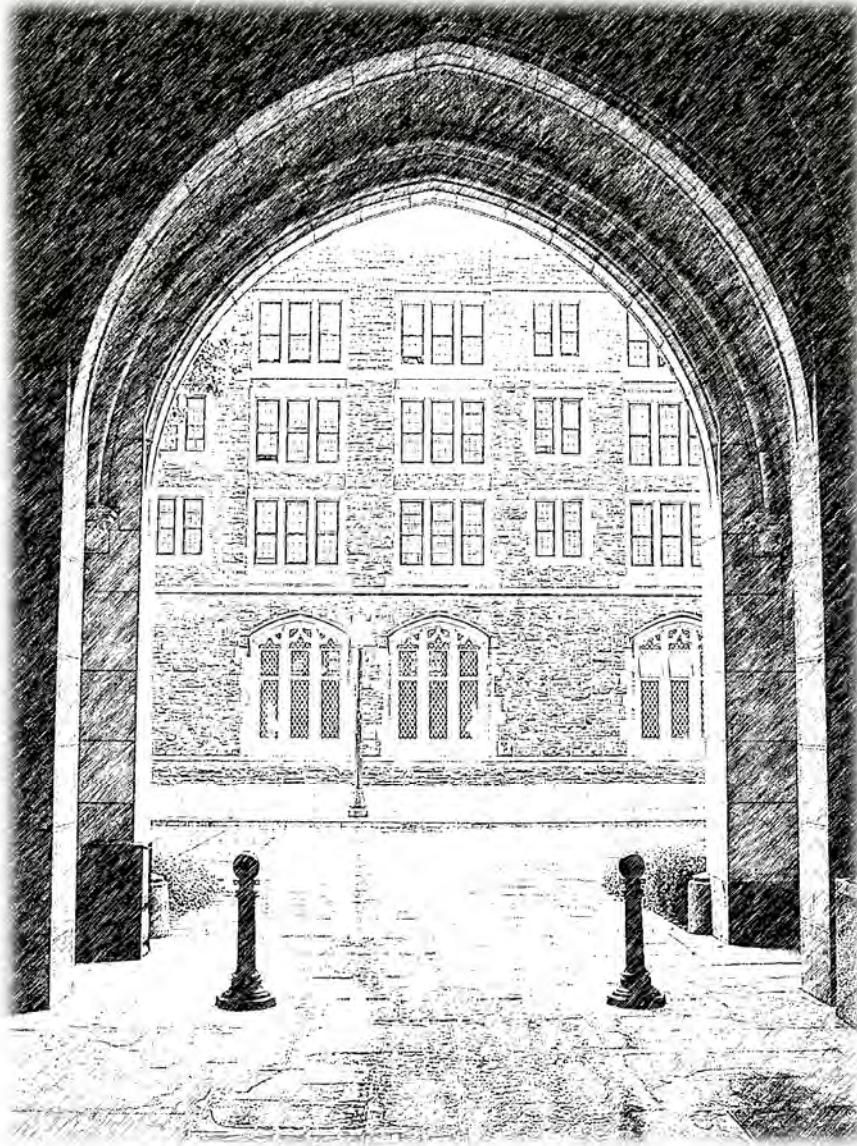


The needs of the Army and strategic guidance drawn from the Department of Defense serve as the basis for deciding what is required of Military Academy graduates. Leading others, rising to the challenge of various missions across the operation spectrum, and dealing with complex technologies—these professional requirements frame the operational concept for the Intellectual Domain described in this document: *Educating Future Army Officers for a Changing World*



Educating Future Army Officers for a Changing World

**OPERATIONAL CONCEPT FOR THE INTELLECTUAL DOMAIN OF THE CADET
LEADER DEVELOPMENT SYSTEM UNITED STATES MILITARY ACADEMY**



Office of the Dean
United States Military Academy
West Point, New York

Table of Contents



I. Introduction

The Army's Needs and West Point's Curriculum	1
Mission of the United States Military Academy	3
The Cadet Leader Development System and Intellectual Domain Goals	4
Integrating Domain Goals and Curriculum	7

II. The Intellectual Domain

The Overarching Goal	9
Mathematics and Science	14
Engineering and Technology	20
Information Technology	27
Cultural Perspective.....	33
Historical Perspective	38
Understanding Human Behavior	43
Communication.....	49
Creativity	54
Moral Awareness	59
Continued Intellectual Development	63

III. Goals, Curriculum, and Assessment

Curriculum	66
Assessment System.....	67





The Army's Needs and West Point's Academic Curriculum



This booklet delineates the operational concept for the United States Military Academy's (USMA) Academic Program.

For more than 200-years, the Military Academy has produced outstanding leaders for the nation who have embodied the notion of selfless service and a commitment to professional excellence. Furthermore, they have served their country with distinction in times of peace and war, demonstrating that they are capable of adapting to unpredictable world situations. Thus, the expectations placed on our graduates are high, and the Academic Program, in support of USMA's intellectual Domain, must be up to the challenge.

Our mission to produce commissioned leaders of character for a career as a professional Army officer and a lifetime of service to the nation demands that we have a clear, synchronized academic plan. Consequently, the USMA Academic Program is the seminal intellectual component of the cadet's 47-month development experience and is designed to enable our graduates to meet the demanding challenges fostered by a rapidly changing world. The Academic Program continues to evolve in support of the Military Academy's Strategic Vision. This strategic vision emphasizes Army values, which are fundamental to the concept of officership as embedded in the Cadet Leader Development System (CLDS), and cadets' personal ownership of these values.

The contemporary military environment requires our graduates to lead a diverse Army deployed



United States Military Academy, Trophy Point.

across the globe, and meet the challenging demands of various missions throughout the operational spectrum. The challenge for the Army officer will be to bring together people and technology to accomplish diverse missions. The intellectual demands placed on the modern Army officer are unprecedented in our history. Today, more than previously, our graduates must deal with complex technologies, rapidly developing situations in complicated multicultural scenarios, and a host of non-traditional missions that demand innovative solutions. This reality requires graduates to be informed, responsible, self-directed learners who can anticipate and respond effectively to challenges that we can predict only imperfectly today.

West Point cannot possibly prepare its graduates for the array of scenarios that may confront them throughout their careers. Therefore, our curriculum must educate them broadly so that they will be able to anticipate and respond effectively to the social, political, economic, and technological challenges

Educating Future Army Officers for a Changing World

that will most certainly arise in today's rapidly changing world. For this reason we are convinced that our overarching academic program goal—anticipation and response to uncertainties—is fundamentally on the mark. Nonetheless, we have a responsibility to posture our graduates to succeed in this fluid global environment, and the process of assessing the Academic Program reveals challenges to our success. We continue to adjust our curriculum to better position our graduates to achieve the overarching goal.

The overarching goal is supported by ten complementary goals: math and science, information technology, engineering technology, cultural perspective, historical perspective, understanding human behavior, communication, moral awareness, and continued intellectual development. Each is described in this booklet using three inter-related themes: the rationale and amplification of the goal statement, expectations of what we expect graduates to be able to accomplish, and a description of the learning model.

Educating Army Officers for a Changing World guides our faculty in the implementation of the Military Academy's strategic concept for cadet development. The strategic vision for the Academic Program draws from Army's needs and is consistent with standards found in higher education. The academic goals are the foundation of a robust curriculum, keyed to meeting the

intellectual needs of our graduates and providing the breadth and depth appropriate to the needs of the Army and the Nation. The excellence of our academic curriculum complements the requirements of our Military and Physical Programs, along with a continuing emphasis on character. Finally, the Academy's motto—DUTY, HONOR, COUNTRY—embodies the Army's core values and represents USMA's 200-year commitment to excellence. This creed will continue to guide us as we educate West Point's young women and men to meet the challenges of the future.

Educating Future Army Officers for a Changing World has been developed by the Military Academy's faculty, past and present, and stands as a testament to their commitment and dedication. Their service in preparing this document has yielded valuable insights about our Academic Program, our cadets, our assessment initiatives, and the meaningful relationship between the Military Academy and the future needs of the Army. ★

Patrick Finnegan
Brigadier General
Dean of the Academic Board
United States Military Academy
September 2007

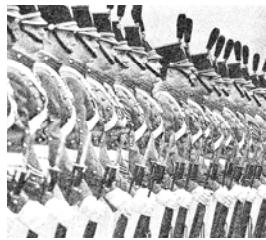




Mission of the United States Military Academy

To educate, train, and inspire the Corps of Cadets so that each graduate is a commissioned leader of character committed to the values of Duty, Honor, Country; and prepared for a career of professional excellence and service to the Nation as an officer in the United States Army.





The Cadet Leader Development System and the Academic Program's Goals



The Cadet Leader Development System (CLDS) is an organizing framework designed to coordinate cadet development activities throughout their experience at West Point. Activities are purposefully structured and planned during the 47 months cadets spend at West Point to ensure that they develop competence in the acquisition and application of professional knowledge associated with the intellectual, physical, military, ethical, social, and human spirit domains. The USMA mission also includes the directive to graduate commissioned leaders of character.

Experiences at West Point are designed to develop cadets in these domains through three formal programs (i.e., Academic, Military, and Physical) along with the Center for Professional Military Ethic. While each program has activities and experiences that influence development in all six developmental domains, the Academic Program has the primary responsibility for developing the Intellectual Domain. To a lesser degree, the Academic Program shares developmental responsibility in the domains associated with character development. For example, the Moral Awareness academic goal contributes an intellectual component to the ethical domain through the development of moral issue recognition, applicable ethical considerations, and well-reasoned responses in the decision making process.



Educating Future Army Officers for a Changing World

The purpose of the Military Academy's Academic Program is to establish the intellectual foundation for service as a highly-educated commissioned officer, and to develop in cadets the knowledge and skills necessary for service and continued growth as an officer in the United States Army. In coordination with the Military and Physical Programs, the Academic Program develops in cadets a professional self-concept as an officer, nurturing each cadet's competence, character, and confidence to act decisively on matters of concern to the nation. The content and process of cadet education and development within the Academic Program enables cadets to understand the interrelated roles of a commissioned officer—soldier, servant of the Nation, and leader of character—and to incorporate these roles into their own emerging professional identities.

Recognizing that we cannot possibly educate and train cadets for every situation they will encounter as junior officers, we must educate them broadly for a career of service. Consequently, the Academic Program affords cadets a broad liberal education designed to develop versatile, creative, and critical thinkers who can adapt to the professional and ethical challenges that will confront them throughout their careers. Toward this end, the curriculum is structured to ensure a shared learning responsibility that will provide a foundation for continued intellectual development.

Accordingly, the overarching goal of the Academic Program at the United States Military Academy is to enable its graduates, as leaders of character, to anticipate and respond effectively to the uncertainties of a changing technological, social,

political, and economic world. From this goal, the Military Academy derives a set of ten goals that address specific Army needs and reflect the intellectual attributes that USMA seeks to develop in its graduates. The achievement and integration of the ten goals enables graduates to anticipate and respond effectively to the uncertainties they will encounter as Army officers. It is our expectation that they will meet challenges, problems, opportunities, and military threats with confidence in their abilities to accomplish their assigned missions. Graduates will be able to examine and assess the social, political, economic, and technological environment to identify new ideas and trends and imagine possible outcomes.

As they prepare to meet the demands of the future, our graduates will be aware of the breadth, depth, and limits of their own understanding and confident in their ability to undertake self-directed study to meet the challenges of new activities and ideas. They will be able to communicate effectively new ideas and insights, generalize or infer new principles about the world, and apply these inferences appropriately. Our graduates will also recognize and appreciate diverse perspectives on complex situations, and employ an interdisciplinary approach to understanding the causes of the challenges they face and the consequences of their actions. Moreover, our graduates will be adaptive and decisive in the selection and implementation of effective responses to the challenges they encounter in various contexts. Throughout their careers, our graduates will know how to formulate goals, generate solutions, communicate effectively, and lead soldiers and units to accomplish their missions, both at home and abroad. ★

The Overarching Goal for the Intellectual Domain



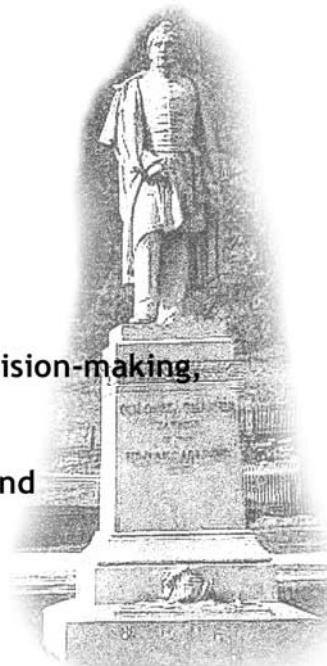
Graduates anticipate and respond effectively to the uncertainties of a changing technological, social, political, and economic world.

Upon achieving this overarching goal, graduates should demonstrate proficiency in six domains of knowledge:

- Engineering and Technology
- Math and Science
- Information Technology
- Historical Perspective
- Cultural Perspective
- Understanding Human Behavior

and be able to:

- think and act creatively,
- recognize moral issues and apply ethical considerations in decision-making,
- listen, read, speak, and write effectively,
- demonstrate the capability and desire to pursue progressive and continued intellectual development





Integrating Domain Goals and Curriculum



Domain goals can be rendered ineffective if they are not aligned with the curriculum.

At USMA, under the auspices of the Assessment Steering Committee we have created a goal team for each of the ten program goals to define corresponding standards, identify where and how in the curriculum they are implemented, and to develop a methodology for assessing cadets' level of success in achieving them. The Overarching Goal for the Intellectual Domain is the provenance of the Assessment Steering Committee as a whole, which consists of the chairs of each of the goal teams. In the following chapters, we present descriptions of the definition, expected outcomes, implementation, and assessment of each goal.

Each section begins with a rationale for the importance of the goal and its relevance to our mission, followed by a description of the outcomes, or what graduates are expected to be able to do upon achieving the goal. The integration of the goal with the curriculum is described in the learning model, a statement outlining the conditions by which students learn and develop with respect to the goal. The learning model serves as a blueprint of the curriculum and provides a conceptual foundation to guide our selection and arrangement of cadets' experiences that are intended to promote their achievement of the Intellectual Domain's goals. Explicitly acknowledged in each learning model are statements about the structure, process,

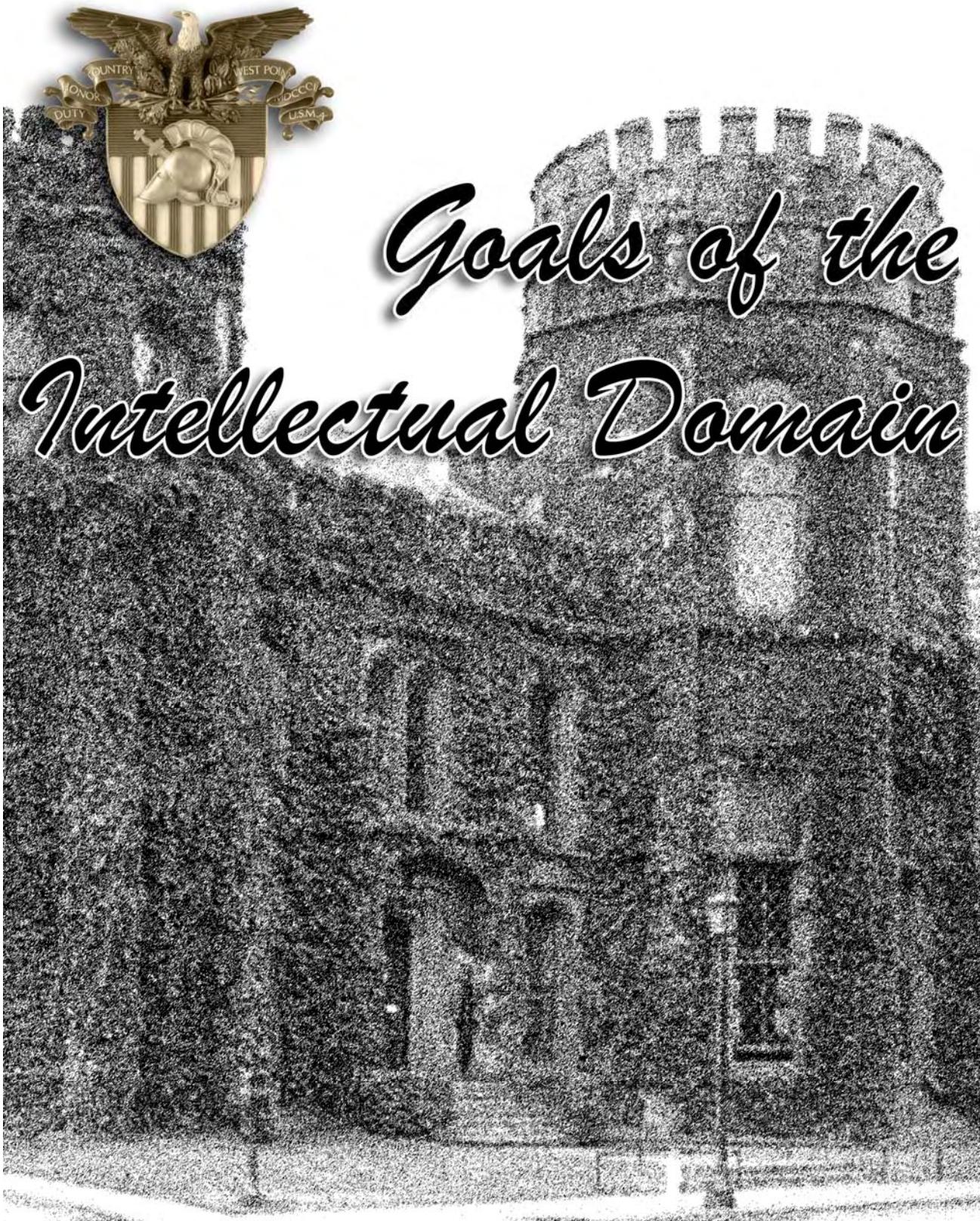
and content of the curriculum that lead to cadets' achievement of each respective goal.

The *structure* of learning experiences represents the domain of student inquiry. The domain serves as a framework to elucidate the areas of study, units of analysis, and ties to other curricular goals necessary to promote intellectual development.

The *process* of learning experiences represents the activities students engage in to achieve the goal. These activities are organized in a sequential pattern to document the progression of learning from an introduction of the material through the achievement of the goal.

The *content* of experiences represents the substance of activities in which students will engage. Substance refers to the specific types of information to which students will be exposed that is consistent with both the structure and process of learning.

Since the publication of *Educating Future Army Officers in a Changing World* in 2002, we have developed and adopted standards for each of the outcome statements associated with the goals. A table of explicit standards associated with the respective goal outcome supplements each the chapters. These standards are used as the basis for assessing the extent to which USMA achieves its academic goals. ★



The old Cadet Library, circa 1903.



The Overarching Goal for the Intellectual Domain

Graduates anticipate and respond effectively to the uncertainties of a changing technological, social, political, and economic world.

Rationale and Amplification

The purpose of the Academic Program is to establish the intellectual foundation for service as a commissioned officer. As one of the three formal programs of the Cadet Leader Development System, the Academic Program develops in cadets the knowledge and skills necessary for service and continued growth as an officer in the United States Army. In coordination with the Military and Physical Programs, the Academic Program enables cadets to develop a professional self-concept of an officer, nurturing each cadet's competence, character, and confidence to act on matters of national security on behalf of the nation. The content and process of cadet education and development within the Academic Program help cadets to understand the four interrelated roles of an officer—warfighter, military professional, servant of the nation, and leader of character—and to incorporate these roles into their own emerging professional identity.

The contemporary world is increasingly characterized by technological, social, political, and economic change, resulting in situations that are dynamic and complex. Army officers will be confronted with situations that may have multiple issues at stake, with no single or dominant focus. Indeed, uncertainty and change are constants of our world and of the military profession; officers must anticipate the implications of such conditions for

the future of our national security. Army officers must also respond effectively to the complexity and uncertainty that characterize the variety of missions they will encounter in the years to come. Within the context of this dynamic national security environment, future officers must be able to provide intellectual and ethical leadership for the profession and the institution that is the United States Army. Consequently, the intellectual and ethical development of cadets remains paramount to realizing the Academy's mission.

We cannot train cadets for every situation they will encounter as officers. Rather, we must educate them broadly so that they have the foundation for continued learning and development as professionals throughout a lifetime of service. Consequently, the Cadet Leader Development System affords cadets a broad liberal education designed to develop versatile, creative, and critical thinkers who can craft effective and ethical responses to the challenges that will confront them throughout their careers. The educational experience at the United States Military Academy is well suited to providing an intellectual foundation for the development of future strategic leaders.

What Graduates Can Do

Graduates can anticipate and respond effectively to the uncertainties of the changing world they will encounter as Army officers. They can meet

Educating Future Army Officers for a Changing World

challenges, problems, opportunities, and military threats with confidence in their abilities to accomplish their assigned missions.

To Anticipate

Graduates are able to examine the social, political, economic, and technological environment to identify new ideas and trends and imagine possible outcomes. In order to prepare for the future, graduates will be aware of the breadth, depth, and limits of their own understanding and abilities, and they will be self-directed, independent learners with the competence and confidence to try new activities and engage new ideas. They will be able to communicate effectively new ideas and insights, generalize or infer new principles about the world, and apply these inferences appropriately. Graduates will recognize and appreciate diverse perspectives on complex situations, and they will employ interdisciplinary approaches to understanding the causes of the challenges they face and the consequences of their actions.

To Respond Effectively

Graduates will be adaptive and respond effectively, either independently or as part of a group, by applying reasoned judgment and integrity to select and implement appropriate actions. Throughout this process, graduates formulate goals, generate solutions, communicate effectively, and lead soldiers and units to accomplish their missions, both at home and abroad. The development of critical thinking, a hallmark of an educated officer, is embedded in all features of the Cadet Leader Development System. Graduates will be able to frame a question or problem from multiple perspectives, identify underlying assumptions, understand central concepts relevant to the situation, use evidence to make well-reasoned decisions, understand the consequences of their decisions and actions, and communicate their decisions clearly.

Overarching Intellectual Domain Goal Standard

Demonstrate ability to:	<u>Anticipate</u> uncertainties, including challenges, problems, and opportunities	<u>Respond</u> effectively to uncertainties with confidence and reasoned judgment
Goal Standard:	In anticipating the uncertainties of a multi-faceted environment, graduates imagine the possible outcomes and consequences of an ambiguous situation. Toward this end, they scan the social, political, economic, and technological environment to identify trends and new ideas; identify one or more problems drawn from the situation; and understand the uncertainties inherent in a problem and one's limitations in dealing with the problem.	Having anticipated potential challenges, opportunities, and threats associated with a problem, graduates respond by determining appropriate action to be taken. Graduates respond effectively to uncertainties through a stated awareness of the breadth, depth, and limits of their problem or situation. In doing so, they frame the problem from multiple perspectives, identify concepts central to the problem or situation, consider analogous historical situations, and examine underlying assumptions; they identify a set of plausible, discernible, and/or alternative options to include military, if appropriate; and they use evidence to make well-reasoned decisions and consider potential second-order effects. They persuasively communicate both the decision and its basis.

The Learning Model

From the overarching goal—to enable its graduates to anticipate and respond effectively to the uncertainties of a changing technological, economic, social and political world—the Military Academy derives a set of ten goals for the Intellectual Domain that address current and future Army needs and reflect the attributes that the Academy seeks to develop in its graduates. The achievement and integration of these goals enables graduates to meet the overarching goal.

Structure of Cadet Experiences

The Intellectual Domain is designed to help cadets acquire knowledge and develop intellectual skills that will enable them to meet goals derived from the Overarching Intellectual Domain Goal. Across the curriculum, cadets develop critical thinking skills within the context of the broad domains of knowledge represented by each goal. The curriculum has three principal structural components: breadth, depth, and integration. The first is a broad set of core courses that balances the physical sciences and engineering with humanities and social sciences, providing a base of knowledge for service and continued growth as an Army officer. The core curriculum, when combined with physical education and military science, constitutes the Military Academy’s “professional major.” A cadet’s opportunity to specialize in a disciplinary major of their choice further enriches their depth of knowledge. Integration nurtures a cadet’s ability to understand patterns and relationships and to employ alternative perspectives when solving complex problems. Within both the core and majors programs, the Intellectual Domain goals guide faculty members in the design and implementation of their courses. Additionally, all cadets participate in an integrative experience within the major that orients on the overarching goal.



First Class cadets visit a “green” building to examine viable solutions to difficult environmental issues. USMA faculty devotes considerable time and personal attention toward developing problems for cadets to solve.

Process of Cadet Experiences

Faculty and cadets share responsibility for learning and development. The faculty organizes programs and courses that relate directly to one or more of the goals. Faculty members provide inspiration, guidance, and relevant learning resources to support cadet inquiry, understanding, and intellectual growth. In general, cadets develop their understanding of basic ideas and concepts through individual and collective study outside of class, supported by a robust information infrastructure, library resources, and learning support activities. In class, cadets refine their understanding and apply it to professionally relevant problems and situations of increasingly greater complexity. Under the guidance of their professors, cadets spend class time exploring the implications as well as the limits of their new understandings. Cadets complete projects, papers, and other homework outside of class in order to extend their understanding and assess their intellectual growth with respect to



Sylvanus Thayer, Class of 1808, served as the Superintendent from 1817-1833. Known as the “Father of the Military Academy,” he enhanced the quality of the academic program, brought discipline to the military environment, and recognized the importance of instilling honor and integrity.

educational goals and objectives. Throughout the Cadet Leader Development System, faculty members organize courses and programs to allow cadets time for reflection and self-assessment, keys to intellectual growth and life-long learning.

With each subsequent year, cadets are increasingly challenged to take greater responsibility for their own learning as the process of cadet education gradually shifts from an emphasis on acquiring knowledge to an emphasis on structuring and using knowledge to deal effectively with challenging new questions, issues, and problems. As cadets progress, self-assessment, and peer assessment complement assessments by faculty members,

enhancing the cadets’ self-awareness, competence, and confidence as self-directed learners.

In the major, cadets learn to integrate theory and practice in a more complex and sophisticated manner. Cadets acquire methods of inquiry that shape the formal knowledge of the field and develop critical thinking and judgment as they actively engage the subject matter. Beginning with the fundamentals within an academic discipline, cadets proceed through a structured set of courses to issues of greater complexity and difficulty.

Cadets validate the goal by completing an integrative experience to synthesize knowledge and skills nurtured in the core and majors programs. Situated within the major, but drawing upon all goals, integrative experiences present cadets with professionally relevant situations that include political, social, economic, and technological issues and challenge cadets to anticipate and respond effectively to uncertainty and change.

Content of Cadet Experiences

The core curriculum provides a broad liberal education in the arts and sciences with a focus on the *profession of arms*. To prepare for the technical challenges they will face as officers, cadets study mathematics and the basic sciences of chemistry, physics, and physical geography. Studies also include topics in information technology and engineering. Studies in the humanities and the behavioral and social sciences help cadets meet social, political, and economic challenges. Courses within the core curriculum include psychology, composition, literature, foreign language, philosophy, history, economics, American politics, international politics, military history, military leadership, and constitutional and military law. The majors program builds upon the foundation of the core, allowing cadets to develop greater competence in selected areas. In addition, the

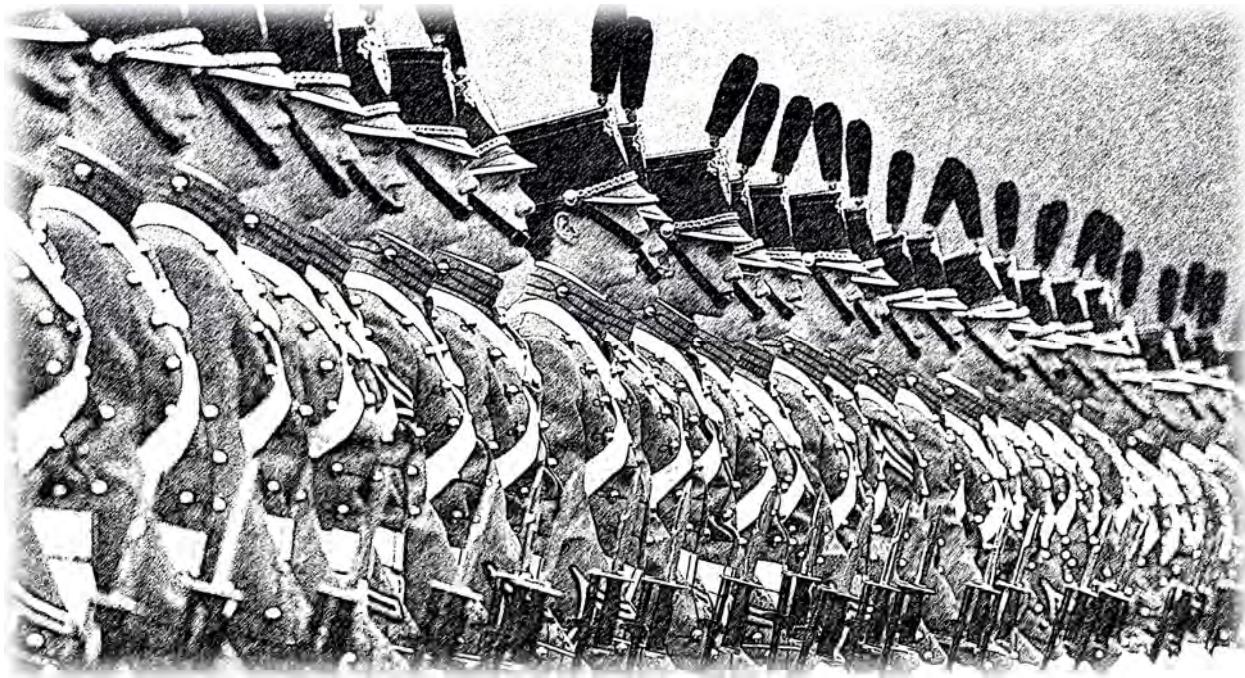


Changing demands on the battlefield demonstrate that officers have to anticipate and respond effectively to rapidly evolving situations.

major nurtures the development of creativity, critical thinking, and self-directed learning, essential characteristics of 21st Century officers. Cadets develop an appreciation for the complexities of national security and officer leadership by integrating their learning around the Cadet Leader

Development System goals and the officer's four interrelated roles: self-awareness, self-directedness, adaptability, and creativity.

The Intellectual Domain addresses directly all four components of officership. The study of military history and military leadership provide the intellectual foundation for understanding the nature of warfare and the officer's responsibilities in combat. Military applications in science and engineering contribute to the development of scientific and technical professional expertise necessary throughout the operational continuum from peace to war. Studies in leadership, ethics, constitutional law, American politics, and international relations help cadets understand the military as a profession, the role of the officer in our democracy, and ethical responsibilities of officer leaders. Faculty members inspire cadets to selfless service by their personal example and nurture cadets' development as officers through involvement with cadets in and out of class. ★





Mathematics and Science

Graduates are scientifically literate and are capable of applying scientific, mathematical, and computational modes of thought to the solution of complex problems.

Rationale and Amplification

The study of mathematics and science as a part of the core curriculum establishes fundamental scientific literacy and enhances the cadets' propensity for rational thought, which together contribute to commissioning officers who are prepared to face the challenges of the emergent national security environment.

For Army officers, scientific literacy has three dimensions. First, officers must possess an understanding of the fundamental principles of the basic sciences. Second, scientifically literate officers view the physical world in a disciplined and objective manner through careful observation of causal relationships interpreted within a framework of physical laws. Third, scientifically literate officers have a foundation to recognize scientific challenges and to seize opportunities when confronting complex problems.

The study of mathematics and science plays an indispensable role in the liberal education of cadets by cultivating *modes of thought* that serve as a foundation for intellectual development. Cadets learn to think rigorously in a context where well-defined structures of axioms drive analyses that subsequently lead to logical conclusions and predictions. They understand and accept model-based hypothesis and experiment as a means for discovering objective truth, and they are inclined to approach complex problems by decomposing them

into parts that are amenable to solution through the application of computational algorithms. Habits of thought developed in the course of studying the basic sciences and gaining fluency in mathematics—the language of science—enable cadets to think more clearly when confronted with a variety of situations. Thus, the core science and mathematics experience provides cadets a cognitive base for development as critical thinkers. This cognitive base extends the range of learning possible in the balance of the core curriculum—engineering, social sciences, and the humanities—as well as in academic majors at the Military Academy and in advanced schooling after graduation.

Historically, the United States Army has relied upon the effective employment of advanced technology to achieve dominance on the battlefield. As we proceed with transforming the Army to meet



A cadet experiment demonstrated during Projects Day.

current and future challenges, exploitation of emerging technologies will continue to play a decisive role. Examples of areas of rapid advances in technology abound, including emerging information technologies, ballistic missile defense, directed-energy weapons, hybrid vehicle propulsion systems, and defenses against biological and chemical threats. To an increasing degree, leaders need to discriminate among competing technologies in order to shape the force. Scientific literacy is an essential attribute of today's leaders; without it our capability to field relevant forces rapidly enough to keep pace with—or indeed to stay ahead of—evolving threats will be in jeopardy. To this end, a firm foundation in mathematics and the basic sciences yields benefits for Army officers from their early years of service and extending through their contributions as senior leaders.

What Graduates Can Do

The pursuit and attainment of the Mathematics and Science goal enhances the development of future Army leaders by producing graduates who can:

- Understand the fundamental scientific principles that underlie military technology.
- Understand the geophysical processes that govern the air-land-space environment.
- Discern the scientific features or aspects of complex problems.
- Construct mathematical models to facilitate the understanding and solution of problems.
- Select and apply appropriate mathematical methods as well as algorithmic and other

computational techniques in the course of solving problems.

- Comprehend scientific literature appearing in the popular press.

These desired outcomes form the basis for assessment of this element of the core curriculum.

The Learning Model

Structure of Cadet Experiences

Cadets complete core mathematics and science goal requirements within the first two years of the four-year curriculum. This temporal arrangement allows for the development of modes of thought—described in the *Rationale and Amplification*—that support the accomplishment of the other Intellectual Domain goals. Several other goals also directly rely upon a foundation in mathematics and the basic sciences. For example, *Information Technology* requires an understanding of the science of sensor systems and of algorithmic thinking, while *Engineering and Technology* rests upon knowledge of the physical sciences and facility with the application of mathematics. Beyond supporting the general liberal education of our cadets, the study of mathematics and science at the core level forms the knowledge base for the education of cadets majoring in the sciences, mathematics, economics, and the various engineering disciplines. The need to support these majors determines the level of rigor that must be present in the core mathematics and science program.

Math-Science Goal Standard

Demonstrate ability to:	Goal Standard:
Understand the fundamental scientific principles that underlie military technology	Identifies the scientific concepts relevant to the employment of military systems. Explains linkages between current military technology and the underlying scientific principles.
Understand the geophysical processes that govern the air-land-space environment.	Recognizes the scientific principles that govern atmospheric and ionospheric weather. Recognizes the scientific basis for the geographic distribution of climates. Recognizes the influence of tectonic activity and other geomorphic processes on the global distribution of landforms. Conducts complete regional analyses of areas of operation by applying a geographic evaluation of terrain, climate, and weather.
Discern the scientific features or aspects of complex problems.	Identifies the relevant scientific concepts and principles when constructing a model to solve a relatively well-posed problem.
Construct mathematical models to facilitate the understanding and solution of problems.	Constructs models to solve relatively well-posed problems. Makes reasonable assumptions. Identifies relevant quantities and derives relationships between them. Uses discrete or continuous, linear or nonlinear, and deterministic or stochastic methods to model relationships. Recognizes when results of the model are inconsistent with reality. Draws conclusions from solutions to the model. Recognizes the value of performing sensitivity analysis of a model.
Select and apply appropriate mathematical methods as well as algorithmic and other computational techniques in the course of solving problems.	Recognizes variations on obvious applications of most well-known methods to solve problems. Adapts a core set of well-known methods when solving problems. Articulates and puts into context definitions, terms, formulas, concepts, and principles.
Comprehend scientific literature appearing in the popular press.	Keeps abreast of current trends in science. Recognizes relevant scientific concepts and principles as they pertain to issues in the popular press. Recognizes potentially false or misleading scientific claims. Capable of obtaining additional information concerning scientific issues.

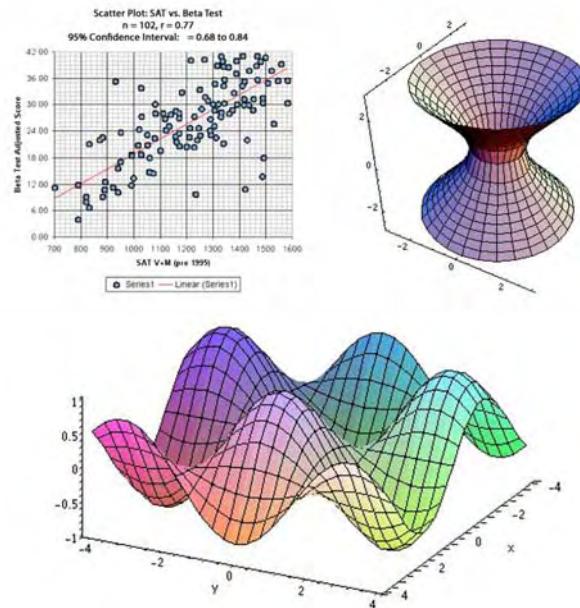


We deliberately order the internal structure of the core mathematics and science curriculum to facilitate progressive intellectual growth. Early exposure to computer science, discrete mathematics, and calculus, along with a fundamental experimental science—chemistry—sets the stage for the subsequent study of calculus-based physics, physical geography, and statistics. In the process of course development, careful coordination of prerequisite knowledge is necessary to optimize the effect of the core mathematics and science experience on cadet intellectual growth.

Process of Cadet Experiences

The pedagogic strategy adopted by a given department is to a degree dictated by the nature of the discipline, but largely is governed by the intellectual maturity of the students, which varies significantly from year-to-year. The following are some of the central themes that pervade the core mathematics and science experience at West Point:

- Sequential Acquisition of Knowledge: Both within and between courses in the core mathematics and science curriculum, cadets build upon principles that are learned early on in order to master new concepts. This sequential approach demands that courses be designed such that cadets develop an understanding of the internal structure of a discipline and of interdisciplinary connections and thus come to view mathematics and science as a unified whole, rather than as a collection of independent topics.
- Problem Solving: Solving problems promotes the internalization of concepts and enhances the development of sophisticated modes of thought. Within the core mathematics and science curriculum, cadets are exposed to problems in a



variety of contexts that progressively become more complicated. Early in the cadets' experience, we emphasize modeling—sometimes referred to as “problem setup.” As cadets advance through the program, the evaluation of results takes on growing significance.

- Laboratory Experience: An indispensable component of the study of the basic sciences is the hands-on experience that cadets gain in the laboratory. This activity promotes retention of scientific concepts and acquaints cadets with the scientific method.
- Use of Technology: Cadets employ technology to facilitate their learning and to extend the boundaries of potential cadet growth. Advances in educational technology allow cadets to visualize scientific and mathematical ideas better. In addition, increases in computational power enable cadets to solve more sophisticated and complex problems.

- Self-Learning: Inherent in the design of the core mathematics and science curriculum is an awareness that cadets arrive at West Point as learners who are ready to accept responsibility for their learning and willing to grow. As the cadets become more mature learners, the core math and science curriculum seeks to shift progressively the responsibility for learning to the cadets, an intellectual transition that enables them to be more successful in their subsequent studies.

Content of Cadet Experiences

The need to develop the scientific literacy required for Army officers and to foster the modes of thought described in the *Rationale and Amplification* guides the selection of subject matter to be included in the core mathematics and science curriculum. Time limits and the level of cadets'



The Core Curriculum includes 11 math and science courses.

intellectual development also influence the content of the curriculum. Based upon these considerations, we incorporate an educational experience that spans the following disciplines:

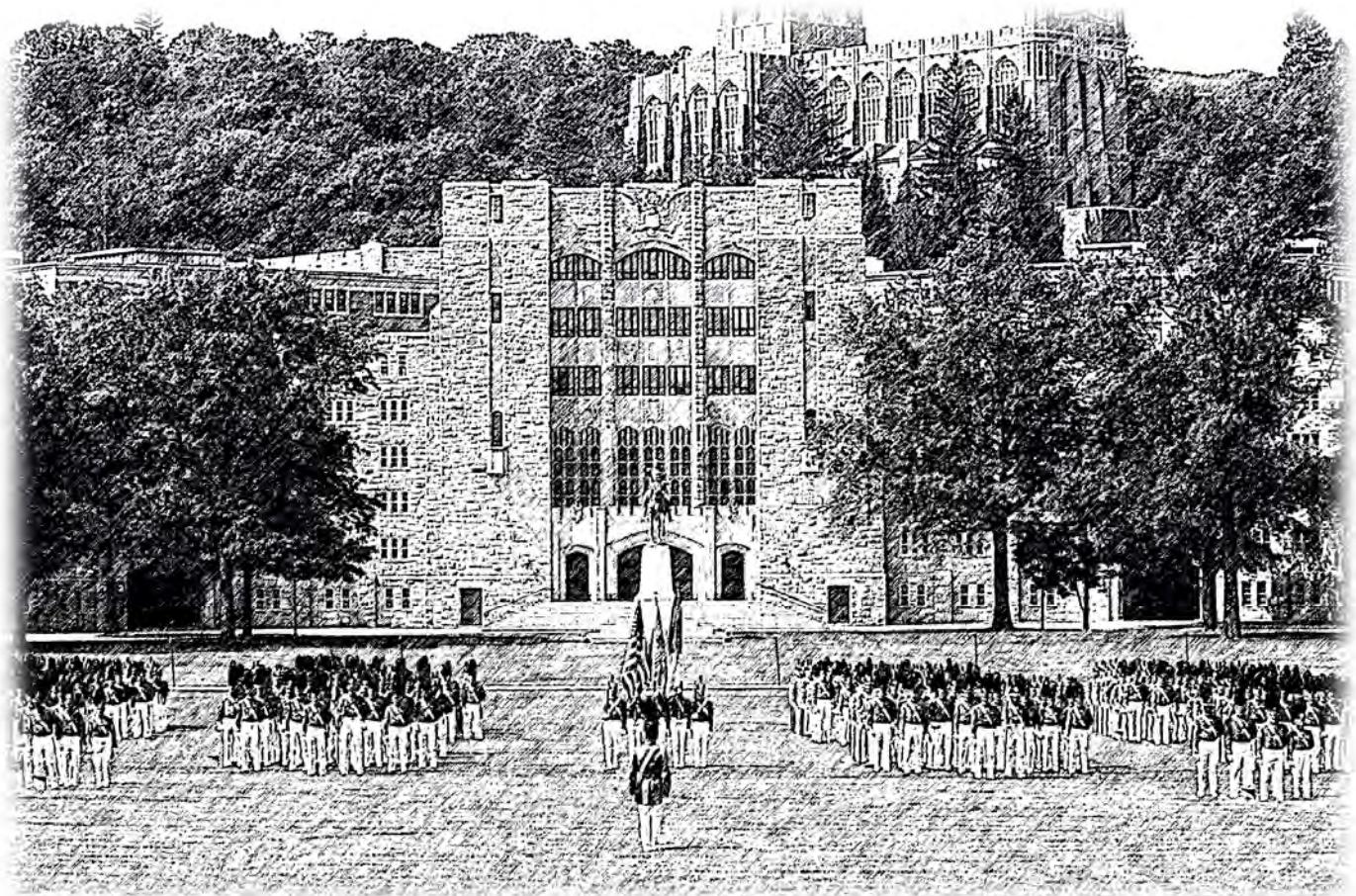
- Mathematics: Coursework in core mathematics encompasses the seven areas endorsed by the Mathematical Association of America for undergraduate programs, i.e., discrete mathematics, linear algebra, differential calculus, integral

calculus, differential equations, multivariable calculus, and statistics. Cadets employ symbolic, numeric, graphic, and discursive methods to describe, to analyze, and to solve deterministic and stochastic—as well as linear and nonlinear—classes of problems.

- Computer Science: Computer science focuses on the specification and creation of algorithms that can be effectively used to solve problems relevant to the Army. We emphasize the decomposition of complex problems into subparts amenable to an algorithmic approach and the employment of sequence, selection, and iteration as the building blocks of algorithms. Cadets gain experience with at least one modern computer language in order to foster algorithmic thinking.
- Chemistry: The core chemistry curriculum emphasizes three of the foundations of chemistry: the structure of matter, chemical equilibrium, and chemical change. Cadets gain facility with the periodic table, learn the fundamentals of thermodynamics, and acquire knowledge about chemical kinetics in order to understand such topics as chemical reactions, acids and bases, electrochemistry, and solubility. Additionally, we introduce radiation and radioactivity as a basis for environmental studies.
- Physics: The core physics experience is primarily a calculus-based examination of the fundamentals of Newtonian mechanics, the laws of conservation of energy and momentum, electromagnetism, basic circuit theory, and optics. The science is presented in a context that emphasizes the physical basis of military technology and that promotes an understanding of situations found in warfare, e.g., weapon-target interaction. We also introduce the physics of lasers and nuclear weapons.

Educating Future Army Officers for a Changing World

- Physical Geography: Gaining an understanding of the scientific principles that govern the formation and evolution of physical landscapes, atmospheric processes, and climate is the conceptual thrust of the study of physical geography. In the course of their scientific studies, cadets gain experience with remote sensing, cartography, digital terrain analysis, global positioning systems, and geographic information systems. Cadets also acquire an understanding of environmental processes in the context of environmental stewardship. ★





Engineering and Technology

Graduates apply mathematics, science, technology, and the engineering design process to devise technological problem solutions that are effective and adaptable.

Rationale and Amplification

The art and science of managing combat power on the battlefield is essentially a scientific/engineering endeavor, requiring a commander to solve a complicated physical problem. Yet this is also an exercise in the humanities/social sciences because we are using people, not just weapons and machinery.

GEN (Ret) John R. Galvin

General Galvin's words capture two complementary aspects of military leadership: (1) understanding and shaping the actions of people and; (2) understanding and shaping the physical world that people act within and upon. Largely, the physical world—which includes man-made technologies and processes—can both enhance and constrain a leader's ability to influence the actions of people. Thus, the ability to shape the physical world and the ability to lead others in doing so are important competencies of an Army officer. Engineering is the process of shaping the physical world to further human goals; therefore, the study of engineering is fundamental to the education of Army leaders.

More specifically, engineering is the application of mathematics, science, and technology, by which the properties of matter and the sources of energy in nature are made useful to people in structures, machines, devices, systems, and processes. The methodology by which technological solutions are created is called the engineering design process.

- Technology is related to engineering in three distinct ways:

- Technology is the product of the engineering design process.
- Specialized items of technology (e.g., motors, pumps, integrated circuits, sensors, algorithms, software) are the basic building blocks of engineered systems and thus are integral to the disciplinary domain.
- Technology can be used as a tool to enhance the effectiveness and efficiency of the engineering design process.

The overarching Intellectual Domain goal is for graduates to anticipate and respond effectively to the uncertainties of a changing technological, social, political, and economic world. This goal complements the overarching goal in that it



Engineering has long been a strength of the USMA curriculum. Here cadets build a trestle bridge during a military engineering class, ca. 1906 (USMA Archives).

demands that our graduates be effective problem-solvers. Engineering is a specialized form of problem solving—one that uses mathematics, science, and technology as tools. Thus, graduates who have studied engineering are well prepared to solve problems in the technological domain. When confronted with a complex, ambiguous situation, they are able to identify the need, articulate requirements and constraints, and formulate solutions that are both effective and adaptable. An effective solution meets requirements, satisfies constraints (including cost constraints), and is delivered on time. An adaptable solution can be readily modified to meet changing needs or unforeseen conditions.

The Army Vision describes the need for a force that is responsive and dominant across a broad spectrum of missions ranging from humanitarian assistance and disaster relief to stability and support operations to major theater wars, including conflicts involving the potential use of weapons of mass destruction. Given this broad diversity of missions and operating environments, the Army needs an equally wide diversity of technical competencies to realize its vision. No single officer could acquire *all* of these competencies. Hence, the USMA engineering core offers focused study in several different engineering disciplines, all of which are relevant to the Army's needs. Each graduate acquires basic-level proficiency in key aspects of a single engineering discipline while, in the aggregate, each graduating class contributes a broad spectrum of technical expertise to the Army.

What Graduates Can Do

Graduates who achieve the engineering and technology goal can accomplish the following:

- In an environment of uncertainty and change, identify needs that can be fulfilled via engineered solutions.

- Define a complex technological problem, accounting for its political, social, and economic dimensions.
- Determine what information is required to solve a technological problem; acquire that information from appropriate sources; and, when available information is imperfect or incomplete, formulate reasonable assumptions that facilitate the problem solution.
- Apply the engineering design process and use appropriate technology to develop solutions that are both *effective* and *adaptable*.
- Demonstrate creativity in the formulation of alternative solutions to a technological problem.
- Apply mathematics, basic science, and engineering science to model and analyze a physical system or process; and apply the results of that analysis to the solution of a technological problem.
- Work effectively as a member of a team to solve a technological problem.
- Plan the implementation of an engineered solution.
- Communicate an engineered solution to both technical and non-technical audiences.
- Assess the effectiveness of an engineered solution.
- Demonstrate basic-level technical proficiency in key aspects of an engineering discipline that is relevant to the needs of the Army.
- In response to a technological problem, learn new concepts in engineering and learn about new technologies without the aid of formal instruction.

Engineering and Technology Goal Standard

Demonstrate ability to:	Goal Standard:
In an environment of uncertainty and change, identify needs that can be fulfilled via engineered solutions.	In an environment of uncertainty and change, graduates identify a need that can be fulfilled via an engineered solution. Graduates demonstrate appropriate knowledge of concepts and principles germane to the need.
Define a complex technological problem, accounting for its political, social, and economic dimensions.	In defining a complex technological problem, graduates are able to discern and articulate relevant political, social, and economic dimensions.
Determine what information is required to solve a technological problem; acquire that information from appropriate sources; and, when available information is imperfect or incomplete, formulate reasonable assumptions that facilitate the problem solution.	Graduates determine what information is required to solve a technological problem; acquire that information from appropriate sources; and, when available information is imperfect or incomplete, formulate reasonable assumptions that facilitate the problem solution.
Apply the engineering design process and use appropriate technology to develop solutions that are both effective and adaptable.	Graduates apply the engineering design process and use appropriate technology to develop solutions that are both effective and adaptable.
Demonstrate creativity in the formulation of alternate solutions to a technological problem.	Graduates formulate multiple alternative solutions to a technological problem, demonstrating creativity in the formulation of at least one alternative.
Apply mathematics, basic science, and engineering science to model and analyze a physical system or process; and apply the results of that analysis to the solution of a technological problem.	Graduates apply mathematics, basic science, and engineering science to model and analyze a physical system or process; and apply the results of that analysis to the solution of a technological problem.
Work effectively as a member of a team to solve a technological problem.	As members of a problem-solving team, graduates assume responsibility for at least one aspect of the solution and effectively integrate that aspect into the team effort.
Plan the implementation of an engineered solution.	Graduates develop a comprehensive plan to translate a completed design into a functioning product or system.
Communicate an engineered solution to both technical and non-technical audiences	Graduates can prepare and deliver technical reports and oral presentations to stakeholders and the general public.
Assess the effectiveness of engineered solutions	Graduates assess the effectiveness of an engineered solution, to include consideration of economic, social, and political implications of the solution.
Demonstrate basic-level technical proficiency in an engineering discipline that is relevant to the needs of the Army	Graduates understand and can apply theoretical concepts to the solution of problems that are frequently encountered in the relevant engineering discipline.
In response to a technological problem, learn new concepts in engineering and learn about new technologies without the aid of formal instruction.	In response to a technological problem, graduates learn new concepts in engineering and learn about new technologies without the aid of formal instruction.



For many years, USMA engineering majors have designed and built a number of innovative projects, such as the concrete canoe shown above.

The Learning Model

Cadets can achieve the Engineering and Technology Goal via one of two paths: (1) successful completion of a three-course core engineering sequence or (2) successful completion of an ABET-accredited major. The learning model described herein forms the basis for the design of the three-course core sequences. The learning model for ABET majors is largely prescribed by the corresponding accreditation criteria. By virtue of the accreditation criteria's extensive requirements for both depth and breadth of engineering proficiency, cadets who successfully complete an ABET major or associated field of study are guaranteed achievement of the Engineering and Technology Goal.

Structure of Cadet Experiences

In the core mathematics and basic science courses, cadets learn the fundamental principles upon which engineering applications are based. These courses also facilitate the subsequent study of engineering by enhancing cadets' quantitative problem-solving

skills and by providing introductory engineering design experiences.

Building on this foundation, cadets take one of several available three-course core engineering sequences. Each sequence is structured to provide depth, rather than breadth in the respective engineering discipline. The three courses in each sequence may be unique; they are not required to be embedded in the corresponding engineering major. Each sequence features an early exposure to the engineering design process, a well-integrated progression from predominantly engineering science to predominantly engineering design, and a culminating design project. This project provides cadets with an opportunity to synthesize and apply concepts from previous courses and to demonstrate substantial achievement of the Engineering and Technology Goal.

The engineering science content of the sequence builds directly upon the mathematics and basic science concepts learned in the core curriculum. As such, the core engineering sequence enhances the achievement of the Math and Science Goal by providing cadets with opportunities to apply math and science to solve practical problems. The engineering design content of the sequence builds directly on the engineering science content, but also draws upon the entire core curriculum to enhance the realism and relevance of the design experience. The design project also reinforces cadets' achievement of the Creativity Goal and the Communication Goal.

Process of Cadet Experiences

The process of cadet experiences leading to the achievement of the Engineering and Technology Goal includes the following:

- Early in the three-course sequence, cadets learn a common model for the engineering design process (described below). This model serves as a conceptual framework for the study of all

engineering science and engineering design concepts in the sequence. Once the framework is understood, key engineering concepts can be learned in the context of their eventual application in problem-solving.

- As they progress through the sequence, cadets develop and apply increasingly sophisticated analytical models to better inform and enhance the design process.
- Cadets experience a progression of projects, ranging from simple, well-defined problems to more complex, open-ended ones. Ultimately, cadets complete a culminating engineering design experience involving the solution of an incompletely defined problem with no single correct answer. As a requirement in at least one course, cadets use a computer software package as a quantitative problem-solving tool, in a manner consistent with standard practice in the relevant engineering discipline.
- In at least one course, cadets learn an unfamiliar engineering concept or learn about an unfamiliar item of engineering technology without the aid of formal classroom instruction.

Content of Cadet Experiences

Cadet experiences in the core engineering sequences consists of three major components: (1) coverage of the engineering design process, which is common to all disciplines; (2) a culminating design project that includes certain characteristics common to all sequences; and (3) coverage of engineering science and engineering design topics that are, in general, unique to each discipline.

The diagram below depicts the engineering design process, as it is taught to cadets in all core engineering sequences. The diagram shows the engineering design process as a cycle, consisting of four major phases—problem definition, design and analysis, decision-making, and implementation. All four phases are performed within a problem-solving environment constrained by technological, economic, political, and social considerations. All

four phases are oriented toward achieving the desired end state—a system, component, or process that meets a human need. Each of the four major phases is itself a cycle—a characteristic that underscores the iterative nature of engineering design. As the diagram suggests, the entire process culminates with an assessment and feedback loop, which is used to determine whether or not the desired end state was actually achieved. If not, then the entire design process can be initiated once again.

The graphical depiction of the engineering design process shown below is incorporated into to the learning model for the Engineering and Technology Goal to ensure that cadets studying engineering in different disciplinary domains have a common basis for their engineering design experience and a common mental model of the process. At the level of abstraction depicted here, the engineering design

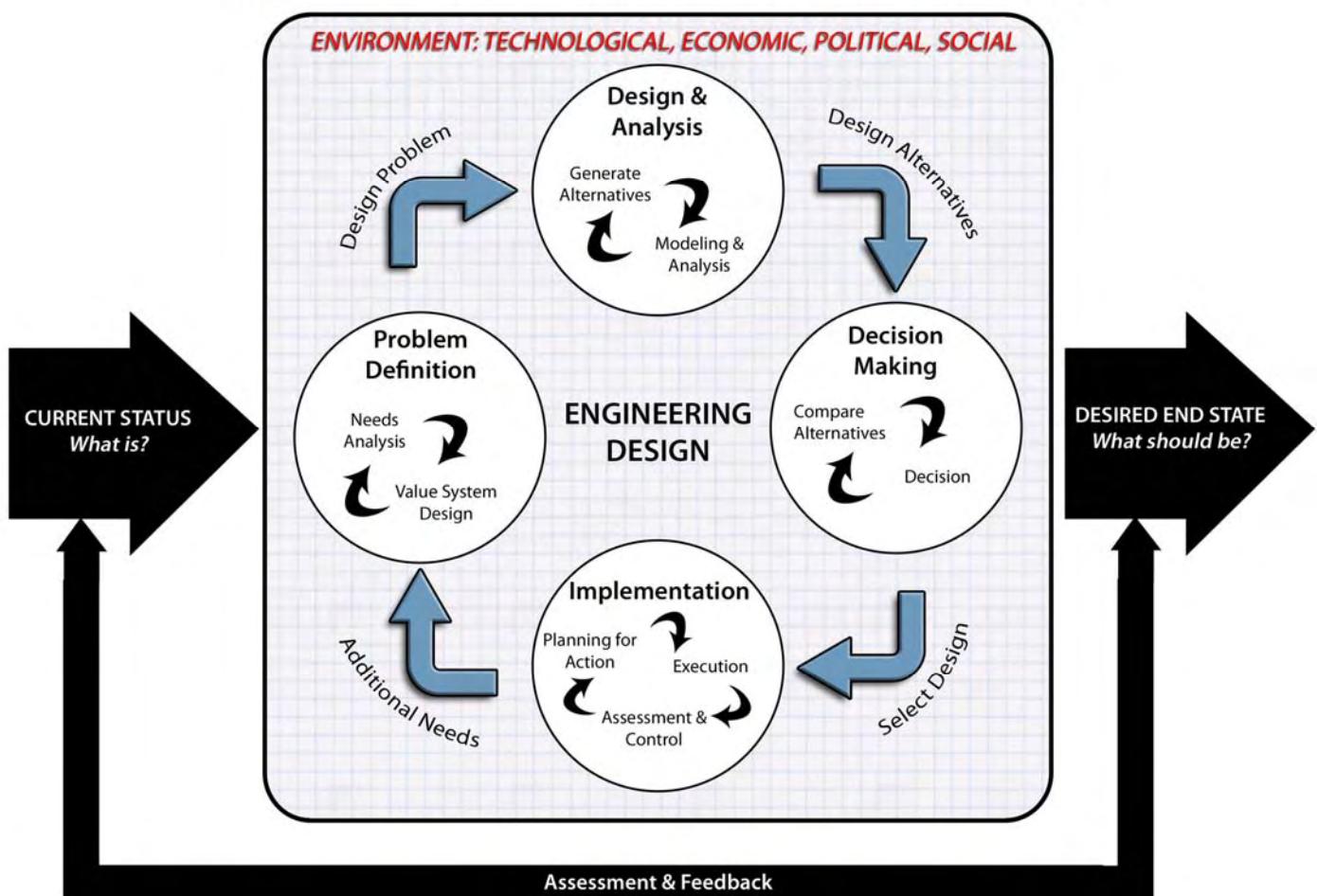


A cadet tests a circuit during an electrical engineering lab.

process is indeed universal, and is analogous to the military decision making process. Different engineering disciplines apply the process in different ways; they place different degrees of emphasis on the various phases; and they may further subdivide the process (into concept design and final design phases, for example). However, the essence of the design process is common to all engineering disciplines, and it is critically important

for cadets and faculty to recognize this commonality. The graphic above provides a vehicle for communicating the universality of the engineering design process to cadets in all core sequences. This model may be adapted to the unique character of a given engineering discipline; however, such adaptations should still retain the essential character of the model.

THE ENGINEERING DESIGN PROCESS



Consistent with the use of a common model for the engineering design process, each core sequence culminates in a design project that has certain common characteristics:

- An incompletely defined problem with no single correct answer.

- Consideration of economic, political, social, and ethical constraints.
- Consideration of more than one design alternative

Educating Future Army Officers for a Changing World

- An opportunity to use creativity in the formulation of design alternatives.
- Application of discipline-specific engineering science concepts to model and analyze alternative solutions.
- A requirement to recommend the best alternative, based on analysis.
- A requirement for cadets to work in teams to solve the problem.
- A requirement to use technology to enhance the problem solving process.
- A requirement for both written and oral reports of the design solution.
- A requirement to assess the effectiveness of the design solution.

The remaining content of the core engineering sequences is largely discipline-specific. Given that a three-course sequence cannot possibly provide comprehensive coverage of a discipline, the content of each sequence is selected and sequenced, such that it provides the minimum essential content knowledge and problem-solving skills necessary to accomplish the design project. The content includes introductory-level exposure to current technologies, modeling techniques, and design standards relevant to the discipline. An introduction to project management is also desirable, either as a means of managing the conduct of the design process or as a means of planning the implementation of an engineered solution. ★





Information Technology

Graduates understand and apply Information Technology concepts to acquire, manage, communicate and defend information, solve problems, and adapt to technological change.

Rationale and Amplification

Information technology advances in the areas of command and control (C2); intelligence, surveillance, and reconnaissance; and precision weapons delivery are dramatically reshaping the conduct of warfare in the 21st century.

Office of Force Transformation

West Point graduates are the future leaders of a transforming Army that embraces Network Centric Operations. In order to succeed as leaders, they must be able to translate information superiority into combat power by exploiting hardware, software, and communications networks to interconnect people and systems, improve situational awareness, and shorten decision cycles.

Information Technology encompasses the knowledge, skills, and tools by which one measures the physical world. IT is also used to disseminate, store, transform, process, analyze and present information to make it possible for an officer to understand the surrounding environment, and aid in the decision making process. While some applications of information technology require relatively little knowledge to use, many others are accessible only to those who have substantive understanding of the underlying technology.

Modern Army officers will need to deal effectively with the pervasive influence of IT on all aspects of military operations—social, political, economic, and technological. Graduates must be able to apply

IT productively, to recognize when information technology would assist or impede the achievement of a goal, and to adapt to changes in information technology. The study of IT as a part of the USMA core curriculum thus enables cadets to understand information technology broadly so that it becomes personally relevant, and it provides cadets with the foundational skills and motivation to acquire future knowledge as information technology changes.

A graduate's IT proficiency is built upon a breadth of foundational knowledge and understanding that enables them to engage in lifelong learning, to become progressively more adept at applying information technology for a range of purposes, and to develop a deeper understanding of the technological opportunities for doing so. All USMA graduates will achieve a substantive level of



Each new West Point cadet is issued a laptop computer.

understanding and proficiency in IT that is focused on abilities of greatest importance to the Army of 2020 and beyond.

What Graduates Can Do

Graduates demonstrate their ability in meeting the IT goal through their understanding of and proficiency in the five areas:

- The underlying physical and mathematical concepts relevant to IT: At the foundation level, graduates can apply sequence, selection, and iteration to solve a problem using computer-based tools. They understand the physical and mathematical principles and constraints governing sensing, computing and communication, and possess a justified confidence in their ability to learn continuously about developments in IT.
- The ways in which systems function: Graduates understand how the components of information infrastructures work together to manage information, and see the IT capabilities that exist at a particular time within the context of continuous

and rapid progress, change, and evolution.

- Methods for successfully employing IT systems: Graduates effectively exploit available IT assets while adapting successfully when parts of the supporting IT structure fail. To defend the integrity of their IT infrastructure, graduates are able to apply information security concepts to risk assessments. They are able to make effective trade-offs between IT performance, cost, and security.
- The effective use of IT to solve problems and make decisions: Graduates recognize when, where, and to what degree IT can be applied effectively to solve a particular problem. Graduates are able to increase the effectiveness of solutions by incorporating IT capabilities. They apply IT in creative ways to acquire, manage, and disseminate information essential to solving problems.
- The importance and implications of IT: Graduates can identify and appreciate the legal and ethical ramifications of the use of IT and recognize significant impacts of digitization on globalization and national security. Drawing on their knowledge of IT concepts, they are able to adapt efficiently to IT-driven changes in doctrine, tactics, organizations, and procedures. As they gain experience, they are able to envision the potential warfighting impact of, and possibilities enabled by, future IT capabilities. IT capabilities must be leveraged to enable interdependent network-centric warfare, supported by sense-and-respond logistics capabilities, within joint, interagency, and multinational full spectrum operations.



The U.S. Military Academy provides state-of-the-art computing facilities for cadets and faculty.

Information Technology Goal Standard

Demonstrate ability to:	Goal Standard:
Understand the underlying physical and mathematical concepts relevant to IT.	Graduates apply basic computing concepts to the solution of problems, are aware of mathematical, physical, and technological limitations, and possess sufficient knowledge to understand future developments in IT.
The ways in which IT systems function.	Graduates understand what the components of information infrastructure are, and understand how they fit together.
Articulate the methods for successfully employing IT systems.	Graduates effectively employ fully functional IT systems, and have a limited ability to adapt when operations are degraded due to system failure. They implement security measures as directed and understand cost effectiveness tradeoffs.
The effective use of IT to solve problems and make decisions.	Graduates recognize IT as a possible solution to problems and attempt to apply IT. They possess a limited ability for incorporating IT into existing systems. They can apply stock IT applications to solve problems.
Understand the importance and implications of IT.	Graduates understand important legal and ethical issues, and apply their knowledge in development of IT solutions. They also incorporate their understanding of IT in analyzing national security issues. They are able to identify impacts and potential of IT on war fighting tactics and strategy.



Cadets learn how to interpret and use satellite imagery, such as this high-resolution satellite image of Iran's Natanz nuclear facility. Image courtesy of Spaceimaging.com.



Cadets learn to use computers and software packages to solve complex problems.

Learning Model

Cadets develop an understanding of IT within a professional context that derives its role and definition from its relevance to the Army and contributes to their growth in the four roles of officership: warfighter, servant of the Nation, member of a profession, and leader of character. This dynamic context requires a combination of academic, military, and personal experiences to form a suitable learning environment.

Structure of Cadet Experiences

Throughout their four years at the United States Military Academy, cadets are exposed to a wide range of IT concepts and applications. The structure of cadet learning experiences in IT is a network of progressive interwoven experiences where academic core courses and other elements of cadet development (e.g., the military program) provide a mutually reinforcing lattice of skills, knowledge, concepts, and intellectual capabilities. An introductory, first year course in IT provides cadets with an initial conceptual framework and develops fundamental skills, which are

subsequently built upon through several domains of inquiry in the Academic Program. For example, IT concepts and applications are addressed through coursework in mathematics, science, engineering, behavioral sciences, and military applications, while economics and political science core courses present cadets with a broad range of social, political and cultural implications of IT. In their third year, cadets in ABET programs develop skills and knowledge for use in an applied engineering setting, while other cadets pursue additional study through a second IT core course, building on the fundamental concepts and skills introduced during the first-year course. By their fourth year, cadets have been exposed to a variety of sophisticated software packages and other technologies, and are well-equipped to demonstrate the level of knowledge and understanding of IT required to meet the academic program goal.

USMA's ubiquitous computing environment is also an integral part of developing cadet understanding and proficiency. As one of the first schools to adopt computers and technology into all aspects of education and cadet development, the Military Academy has developed a cultural expectation that all cadets will use computers and other technologies daily for both work and communication. Every cadet receives a designated computer and a specified software support package. Internet access is provided within each living space, classroom, laboratory, and the library, and course assignments require a high level of interaction between cadets and IT applications.

Research has shown that students learn and retain the least knowledge during lectures and the most when the student is actively involved in learning activities. USMA incorporates more active learning activities into each course and works to improve the quality of the cadet education. Information

technology is an important catalyst in active learning. Computers connected to the wireless network enhance teaching and learning by providing an information-rich environment.

The Military Academy enables achievement of the IT goal by providing a technology-rich, structured learning environment throughout all four years of a cadet's intellectual development. The core curriculum and subsequent coursework for the completion of a major collectively employ a progressive learner development model.

Process of Cadet Experiences

Cadets achieve the goal by engaging in a variety of activities, organized to provide a logical progression of learning from an introduction of material through advanced coursework. Throughout this progression, they are exposed to increasingly sophisticated IT applications and implications. In introductory IT coursework, cadets acquire an initial conceptual framework and learn to operate a variety of operating systems and applications, resolve basic software and hardware conflicts, and use an integrated PC-based communications network. Through coursework in several disciplines including IT, cadets learn to create and use graphics and multimedia to present ideas and concepts and to analyze the sources of web-based content in their research. Cadets also use the Internet for research and many of their courses involve web-based course materials and assignments.

Assignments in advanced IT-related courses build on a basic understanding of database management systems, computer networks, artificial intelligence, and computer hardware. These courses challenge cadets to solve increasingly complex technical problems as they learn basic program design and construction techniques, and how to design, build, and maintain communication networks.

Policies and standard procedures within the USCC chain of command and in core military science courses complement this academic coursework, as cadets conduct their daily business using electronic mail and disseminate chain of command, club, sport, and other information using the USMA e-mail and Intranet web servers.

Content of Cadet Experiences

Producing graduates who demonstrate an understanding and proficiency with IT can be achieved best by a blending of experiences in and outside of the classroom. The entire four-year cadet experience develops understanding and proficiency of IT, providing foundational instruction, a pervasive information environment, a core academic experience in relevant disciplines, and military experiences in employing computer, communication, and sensor systems.

Throughout their core courses, cadets learn to use, evaluate, and select appropriate computing system tools to solve real-world problems. They develop personal skills in the effective use of fundamental computing applications such as word processing, spreadsheet analysis, desktop publishing, database



Officers are expected to use increasingly complex systems in the field, such as these Predator drones. High technology systems require officers to understand and manage information at unprecedented levels.

Educating Future Army Officers for a Changing World

management, presentation graphics, computer security, and telecommunications software. During upper-level coursework, cadets work closely with relevant examples of military systems, as well as the effective use of IT within a particular discipline (e.g., sensors and communications in Physics and Mathematics, and geographic information systems in Physical Geography). Thus, cadets gain an understanding of challenges through exposure to the interdisciplinary nature of IT in core courses.

The first year introductory course in Information Technology emphasizes hands-on learning. Cadets learn how computers work and how they are used both in the military and in the civilian sectors. Cadets also learn how to solve problems with computers by using modern applications software and by writing programs to build a fundamental knowledge of algorithms.

The third year course in IT builds on the core curriculum to develop further understanding of the physical and mathematical principles governing sensors and communications as they apply to IT

systems. Cadets develop their abilities to describe, analyze, and evaluate information systems and the components of selected current and emerging information technologies. The course inculcates understanding of the nature of pervasive change in IT. Cadets acquire skills and knowledge relevant to effective information assurance and develop the ability to make informed and rational decisions involving the legal and ethical dimensions of IT. Cadets in ABET-accredited majors also acquire skills and knowledge in these areas, and pursue additional study in a broad-range of information technology applications in the field of Engineering. Overall, achievement of the Information Technology Goal is required of all cadets, regardless of major. Thus, a robust combination of formal and informal learning experiences throughout their four years at West Point enables cadets to understand and use IT with increasing sophistication and success, and provides the foundational skills and motivation to acquire future knowledge as IT develops throughout their personal and professional lives. ★





Cultural Perspective

Graduates draw from an appreciation of culture to understand in a global context human behavior, achievement, and ideas.

Rationale and Amplification

Given the current global environment, our graduates will continue to encounter challenging wartime and peacetime missions. In response to those challenges, a successful graduate will be able to draw upon an understanding of culture in the accomplishment of the tasks required of a leader of character. That is, leaders must be able to apply an understanding of culture and culture systems in order to succeed in their assigned duties.

There are many different definitions of culture. In our context, we define culture as the totality of learned behaviors, attitudes and a shared way of life that is passed on to succeeding generations. Cultures emerge in any group of people from a small cluster to an entire society. These cultures, and indeed subcultures within cultures, emerge as a product of human interaction around efforts to make sense of existence and to meet the needs of the group. To comprehend fully how people think, feel, act, and communicate, one must consider the cultural context of the group.

An analysis of culture involves the study of its substance and forms. The substance of culture includes beliefs, values, and norms that are emotionally laden and interrelated in such a way that they bind a group together, and helps them make sense of and adapt to their physical and social environments. Cultural forms include symbols,



Today's demanding mission profiles place officers in challenging cultural scenarios like never before. In this image, Soldiers speak with the local children during a routine patrol in Al Wardiya, Iraq.

language, narratives, and practices. These various forms communicate cultural substance. Cultural artifacts, such as art, music, language, literature, architecture, and manner of dress, are manifestations of unique cultures. It is the culture's specific ways of living that give meaning to these artifacts. Subcultures and countercultures emerge within culture groups to represent segments of people whose needs are not fully met by the larger group. Such groups may be formed on the basis of a wide variety of perceived common characteristics, such as ethnic identity, religion, socio-economic status, or similar beliefs or interests.



Officers are being asked to work with coalition forces at increasing levels. In this image, 3d Infantry Division Soldiers operate a checkpoint with Iraqi units in Jamia, Iraq.

Culture reflects and shapes human thought, action, and feelings. Because leaders must understand people to influence behavior and to operate effectively in different environments, the ability to recognize the fundamental elements of culture is a necessary attribute for our graduates. Moreover, given that Army officers are likely to experience a greater variety of cultural environments both at home and abroad, an expanded cultural awareness is essential. Demographic projections suggest that the Army will be increasingly composed of soldiers of progressively more diverse ethnic backgrounds. At the same time, the Army is likely to be involved in combat situations, frequent peacekeeping missions, disaster relief efforts, and other stability and reconstruction operations that will require engagement with other cultures to ensure mission success and protect our national interests.

What Graduates Can Do

West Point graduates who achieve this goal appreciate diversity in American culture and the challenges of performing wide-ranging missions in

multicultural environments. Their appreciation of American pluralism prepares them to lead Soldiers of diverse backgrounds and to adapt to changing national security objectives. Their awareness of global multicultural issues and sensitivity to differing perceptions of those issues enables them to meet professional demands related to their duties in an uncertain future that requires their service around the world.

From a cultural perspective, the contemporary global environment creates a particularly challenging dilemma for the modern professional officer. During the course of their careers, officers will be engaged in diverse missions in many different regions of the world. These missions demand a sophisticated understanding of the beliefs, values, and norms influencing the communications and actions of allies, neutrals, and enemies. Because graduates may serve anywhere in the world, they cannot possibly know beforehand every culture or subculture that may become relevant to their missions. Yet, they can apply their insights and awareness of cultures and culture systems they have studied to the process of learning about new cultures they may encounter at home and abroad.

Finally, cultural awareness—an informed and adaptive attitude towards other cultures—can enable each graduate to become a more informed leader of character. Persons willing and able to see the world from others' perspectives and not just from their own narrow view of social reality are more successful at overcoming ethnocentrism and prejudice. Graduates who have been exposed to different cultures are more likely to respect other people and appreciate similarities and differences in the way others think, speak, act, and appear.

Cultural Perspective Goal Standard

Demonstrate ability to:	Goal Standard:
Analyze contemporary and historical events from different cultural perspectives.	Analyze and understand the current and past events as well as that culture's distinctive interpretation(s) of those events. Complete this analysis by examining traditional responses to change, delineating the components of that culture, regional variations in cultural diversity/human behavior, and spatial linkages among culture systems.
Apply understanding of culture wherever stationed or deployed around the world.	Analyze and understand cultural landscapes (i.e., political, economic, military, social, cultural and religious systems), their geographic distribution(s), and be cognizant of similarities and differences as they affect decision-making.
Understand diversity among people both home and abroad.	Analyze cultural diversity and human behavior in domestic and international scenarios, recognize a range of similarities and differences in common cultural practices illustrate regional dissimilarity in cultural practices and demonstrate how these differences/similarities drive choices in domestic and international relations and military/civilian law.
View the world from the perspective of someone in another culture.	Analyze current and past events of the culture under study, and be able to view events, issues, and choices in international relations from multiple perspectives. Understand how individuals and cultures pursue social, political, and economic goals.



Cadets participate in the Advanced Individual Development program to broaden their cultural perspective.

The Learning Model

Structure of Cadet Experiences

Throughout their four years at the United States Military Academy, cadets are exposed to the pluralism of American society and also have opportunities to interact with international cadets and officers. These encounters and other extracurricular experiences supplement the curriculum and extend cadet cultural awareness. At West Point, cadets are challenged within domestic and international contexts to develop their ability to examine and respect the elements of culture (i.e., beliefs and values; ideologies; customs and



L'Ecole Nationale des Officiers D'Active Thies, Senegal.

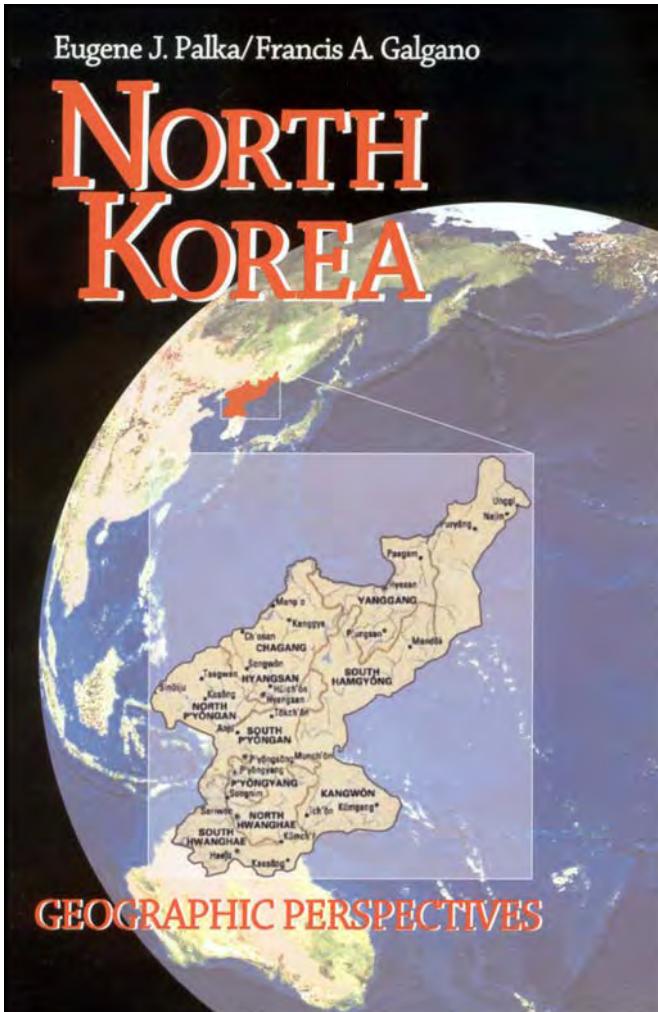
practices; institutions; social structures; technological manifestations; and change mechanisms).

Process of Cadet Experiences

In terms of the processes of learning and the content of different disciplines, cadet experiences emphasize both professional application (leadership in a changing technological, social, political, and economic world) and personal growth (human fulfillment and respect for others).

Cadets' exposure to the curriculum provides several distinct cultural experiences:

- Cadets develop a broad knowledge and awareness of human culture by studying cultural elements in different cultural contexts.
- Cadets learn about the components of culture, how cultural traits diffuse through society, the geographic patterns of culture groups and their regional and global connectivity.
- Cadets analyze contemporary and historical events from different cultural perspectives through linkages between language and history.



Educating Future Army Officers for a Changing World

- Cadets participate in various aspects of culture (e.g., language, literature, and practical, traditional, and artistic manifestations).
- Cadets transfer their understanding of specific cultures to the study of new cultures or subcultures through methods developed in the academic study of cultural elements.
- Cadets participate in Academic Individual Advanced Development (AIAD) and Cadet Troop Leadership Training (CTLT), which provide opportunities to become immersed in other cultures.
- Cadets apply their knowledge and understanding of diverse cultures to simulated and real-world encounters in order to apply intellectual agility, decisiveness, and cultural astuteness in preparation for the challenges of service to nation as citizens and leaders.

Content of Cadet Experiences

Many disciplines within the humanities and social sciences introduce cadets to a variety of pluralistic and multicultural experiences. The core curriculum directly supports the learning model, which outlines

relevant applications of the cultural perspective goal. Cadets' education and training encompass formal learning and cultural contacts that promote firsthand understanding of the variety and richness of human culture. This experience assists their development as professional military officers and their development as citizens in a global setting.

There is a hierarchy to humanities and social science courses and one basic science course that support the learning model. Two clusters within the learning model lead cadets from introductory levels of substance, theory, and methodology to more broadly based analyses. Cadets are exposed to the introductory cluster (English, Language, History, Leadership, Psychology, Philosophy, American Politics, Economics, and Geography) during their first two years and to the second analytic cluster (English, History, Foreign Language, Law, Leadership, International Relations) during their last two years at the Academy. Moreover, experiential applications and concomitant learning pervade the entire spectrum of academic and military programs. Cadets are exposed to more advanced examinations of culture as part of the study in depth component of the curriculum and through minors programs. ★





Historical Perspective

Graduates draw on an appreciation of history to understand in a global context human behavior, achievement, and ideas.

Rationale and Amplification

In its broadest sense, history is the study of humans and their ideas, societies, and institutions over time. The study of the past builds a base of knowledge that serves as the foundation for the humanities and social science component of the core curriculum. While providing that base of knowledge, the study of history also yields a broadened cultural perspective and fosters insights vital to informed ethical choices. Students of history gain insights not only into the different ideas and experiences that comprise America's pluralistic society but also into those of a diverse world. Developing a sensitivity to the ideas and experiences of others across location and time enables leaders to have a better understanding of human behavior.

The Army expects its leaders to have an historical perspective and to be sensitive to patterns of continuity and change in the evolution of societies and their military forces. The Army believes that an historical perspective is especially important in today's rapidly changing world, for it enables leaders to discern broad patterns and to anticipate and shape change. The Army also recognizes that an understanding of how societies and military forces have dealt with challenges in the past, yields insights and ideas for leaders and enables them to address contemporary challenges more effectively. To this end, cadets acquire a specialized body of knowledge about the challenges confronted by past

military leaders. This body of knowledge, an important aspect of professional expertise, includes an awareness of earlier wars, military systems, and technologies, and how they have influenced armed forces and societies of today.

The study of history develops critical thinking skills. When students of history conduct historical analyses, they determine the more plausible causes among many possibilities of why historical events happened, and they must consider the relationship between ideas and actions. They must gather facts, evaluate conflicting evidence, and establish a link between cause and effect. During this analytical process, students must deal effectively with ambiguity and must recognize that clear cause-and-effect relationships for past events are not always discernible. As students of history learn how to



USMA cadets train on 12 inch coastal defense mortars in Battery Byrne, circa 1903 (USMA Archives).

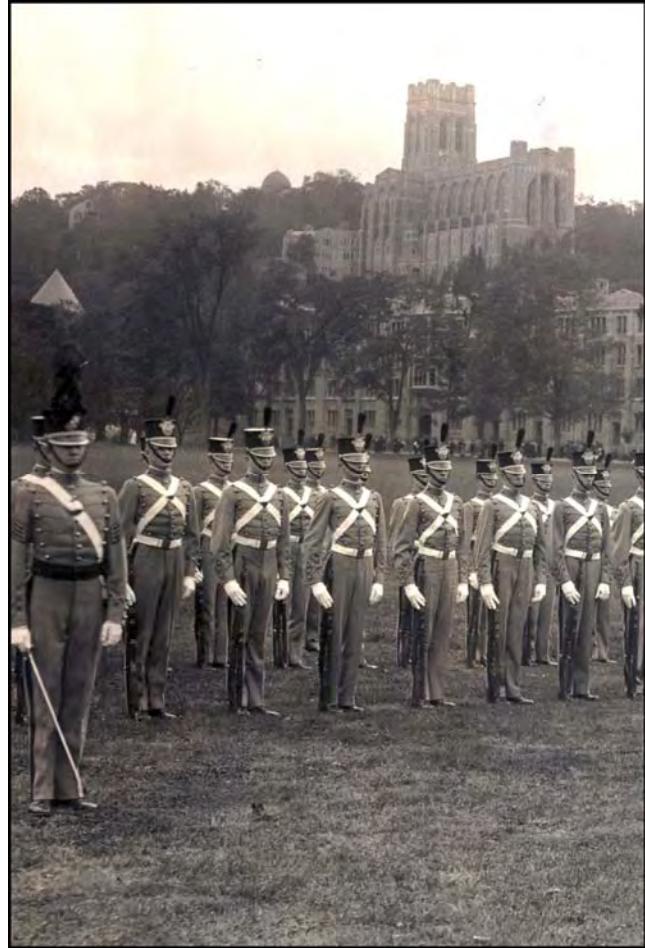
analyze historical events, they gain a deeper understanding of the complexity and ambiguity of current and future events; they also develop analytical reasoning abilities.

Achieving the historical perspective goal and developing critical thinking skills thus contributes significantly to graduates' achievement of the Military Academy's overarching goal. The acquisition of an historical perspective is also fundamental to an officer's development as a member of a time-honored profession, with a rich lineage and a set of traditions that shape professional identity and purpose.

What Graduates Can Do

Graduates who achieve the goal draw upon an appreciation of history as they address issues pertaining to leadership, administration, policy, planning, and decision-making. As they advance through positions of increasing responsibility, the choices they make as leaders are informed by their understanding of the historical context of contemporary ideas, events, and institutions. Such an understanding enables them to discern broader patterns of continuity and change, particularly in an era of increasingly rapid technological and cultural change, and to recognize the relationship between ideas and actions.

From their study of the past, and skills at historical analysis, graduates have a deeper understanding of the complexity and ambiguity of events. Through an analysis of historical events, graduates also learn to discern patterns in the evolution of societies and institutions. The awareness of such patterns enables them to anticipate and shape change by drawing on their knowledge of how individuals, organizations, cultures, and societies have behaved and addressed challenges in the past. Graduates incorporate these insights into their professional



*USMA cadets during a full dress parade, circa 1928
(USMA Archives).*

decision-making, but while they recognize that the experience of the past offers important insights and ideas, they understand it does not provide formulas to be applied blindly to current challenges.

Because officers serve as teachers with increasing influence over time, graduates strengthen historical perspectives in the Army and enhance the professional development of others. By strengthening the professionalism of the Army and anticipating and shaping change, graduates will be better able to help the Army fight and win our Nation's wars.

Historical Perspective Goal Standard

Demonstrate ability to:	Goal Standard:
Possess knowledge of how individuals, organizations, cultures, and societies behaved and met challenges in the past.	Demonstrate knowledge of key historical persons, events, and developments and employ historical thinking and analysis. They demonstrate this knowledge orally and in writing.
Discern patterns of continuity and change in the past.	Can use historical evidence to assess given situations both preceding and following historical change, and can describe the limits of that change.
Understand the complexity and ambiguity of change over time. Evaluate complex evidence critically and establish appropriate links between cause and effect.	Can identify conflicting points of view, analyze conflicting or ambiguous evidence, establish causal relationships between facts, and draw informed conclusions based on their own critical analysis.
Incorporate historical insights into their professional decision-making.	Understand and appreciate the role of historical insight in informing the decisions of political and military leaders. Apply this knowledge to inform their own professional decision-making.





The Learning Model

Structure of Cadet Experiences

Cadets progress through a clear progression of analytical experiences that develop in them an appreciation of how individuals, organizations, and societies have addressed the achievement of political, economic, social, and technological goals over time and across cultures. These experiences involve the study of humans and their political, social, economic, technological, and military experiences and systems over time.

Within the Military Academy's curriculum, these experiences provide a foundation for and inform other efforts to pursue related curricular goals.

The interdisciplinary use of historical examples and case studies exposes cadets to the evolution of ideas and institutions over time.

Process of Cadet Experiences

Cadets first acquire a factual foundation and develop a facility with the elements of historical analysis and then refine and apply those elements in an increasingly sophisticated manner. Although the process is initially a sequential one, it quickly challenges cadets to deal simultaneously with different levels of historical analysis and synthesis.

Within core history courses, cadet understanding derives from the following experiences:

- Cadets acquire an understanding of the who, what, where, when, and why of selected historical developments and events; and learn the basics of history--how to distinguish between facts, inferences, and opinions.
- Cadets learn to evaluate evidence and establish causal relations between facts.
- Cadets deal with conflicting points of view, analyze conflicting evidence, and learn to make judgments on the basis of their analysis.
- Cadets in each of the core history courses learn to analyze and synthesize sophisticated historical opinions from multiple perspectives.
- Cadets learn to identify and understand assumptions and biases of others' historical judgments to attain a more balanced perspective.



Soldiers from the 2nd Bn., 508th Infantry Regiment hunting for the Taliban in Andar Province, Afghanistan.

Beyond core history courses, cadet understanding derives from the following experiences:

- Cadet experiences cumulatively enhance the quality and variety of cadet historical knowledge.
- Cadets consider a variety of historical perspectives in their study of an enhanced body of knowledge. As they progress through the core curriculum, they bring other intellectual frameworks to this effort and thus appreciate the value of an interdisciplinary perspective.
- Cadets become increasingly more sophisticated and precise in presenting their historical analyses in discussion, formal presentations, essay examinations, and research papers.
- Cadets' study of history provides insights useful to the accomplishment of other academic program goals, especially those related to human behavior, cultural perspective, and communicating effectively.

Content of Cadet Experiences

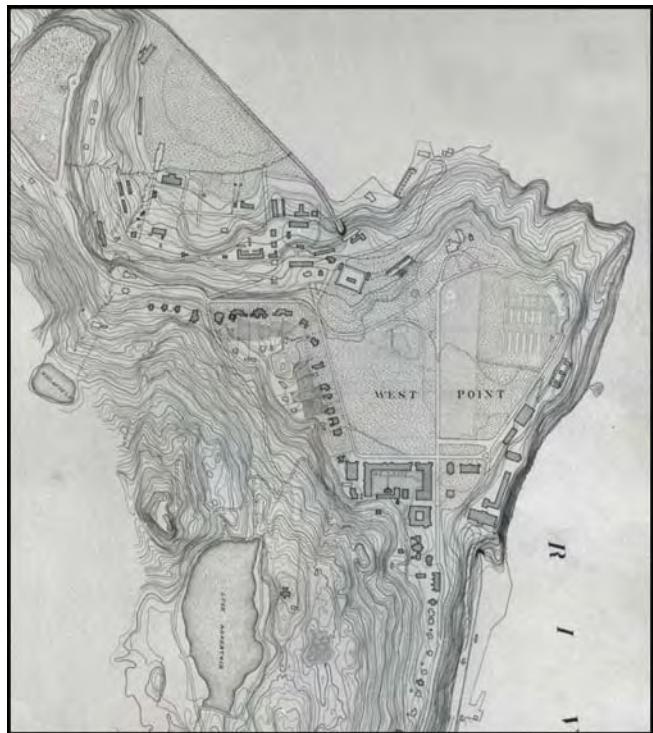
While acknowledging the existence of many relevant historical sub-disciplines, the Military Academy uses American and world history as its foundation courses in the core curriculum because of their relation to the American tradition, their contributions to American pluralism and multicultural perspectives, and their importance to the study of the profession of arms. Cadets who study American history in the core curriculum do so from an international perspective to obtain a better sense of global developments, trends, contexts and cultural diversity.

Sequenced study in the historical discipline strongly supports the emphasis in the Military Academy's curriculum on understanding issues involved with the profession of arms. The Military History core course builds on the foundation history courses and refines the elements of historical analysis to

examine the evolution of warfare, the causes and conduct of war, the role of war and the military in various societies, and military leadership.

The history core courses balance content (the factual breadth and depth of the human experience) and theory (the use of a variety of frameworks and perspectives to understand and explain the human experience). Cadets apply various perspectives (political, social, economic, technological, cultural, and threads of continuity, for example) to historical issues to develop a facility with a variety of intellectual frameworks.

Cadets apply elements of historical analysis and gain historical insights in other academic disciplines and in other cadet experiences as they use their maturing critical thinking skills to address complex issues and solve problems. ★





Understanding Human Behavior

Graduates understand patterns of human behavior, particularly how individuals, organizations, and societies pursue social, political and economic goals

Rationale and Amplification

Army leadership is ultimately a human endeavor, thus understanding human behavior is critical to the intellectual development of West Point graduates. The Army's Vision states that "the Army is people" and that the Army is "about leadership. It is our stock and trade, and it is what makes us different." The key to effective leadership begins with a clear understanding of one's own behavior. Self-awareness is the foundation for understanding human behavior. As lieutenants, graduates will lead soldiers in platoons and must understand their own behavior, the behavior of the individuals, teams, and organizations they serve in order to accomplish assigned tasks effectively. As captains, they must understand how complex organizations operate in order to accomplish tasks that are more problematical so that they can command companies and work effectively on organizational staffs. As field grade and senior officers, graduates will work at increasingly higher levels of responsibility and must be able to understand what motivates individuals, groups, and organizations, and thus to accomplish vital missions and improve continuously in a dynamic national security environment. Throughout their careers they must guide and mentor people in order to implement technological, social, political, and economic change. Understanding human behavior as it responds to continuous change is a fundamental competency of successful officers.

Because leadership is a function of the leader, the led, and the situation, understanding human behavior is important to graduates in several areas. First, the social dimension of human behavior helps graduates understand their own behavior and underlying motivations, as well as the activities and motivation of individuals, groups, and organizations that they will lead. This understanding enables them to make wise decisions as they lead individuals and organizations. Second, the political-economic dimension of human behavior helps graduates understand the broader context of their decisions. Graduates appreciate the factors that influence the behavior of states and other international actors and they understand foreign policy tools. This dimension includes an awareness of the importance and limitations of military power,



A U.S. Soldier hands a humanitarian assistance package to an Afghan man in Paktika, Afghanistan.

the constitutional structure, and underlying values of the American political system, and the subordination of the military to civilian authority. Third, the human behavior dimension requires graduates to develop an understanding of the characteristics and culture of the military profession and the unique role it plays in American society. Graduates can recognize and communicate the shared values of the profession in order to reinforce the military's proper contribution to national security missions. These basic dimensions—social, political, economic, and professional—amplify the general goal of understanding human behavior.

Understanding humans differs from the ideas of cultural and historical perspectives in that it emphasizes human behavior, particularly purposive behavior aimed at the achievement of social, political, and economic goals as well as the appropriate application of technology. The study of history and culture supports the goal by showing that different societies address the achievement of social, political, and economic goals in different ways over time. The goal provides an explicit link between the foundation in history and culture and the general goal of understanding, anticipating and effectively responding to social, political, and



Soldiers from the 14th Combat Support Hospital assist at a women's clinic, which is part of the Egyptian Hospital on Bagram Airfield, Afghanistan.

economic change. Effective leadership within the ranks of our military requires an understanding of psychological and social theories of human and organizational behavior.

What Graduates Can Do

The Army needs officers who understand what motivates human behavior and ones that can apply that understanding effectively as leaders to anticipate and respond to a variety of situations across multiple organizational levels. Graduates are self-directed, reflective learners with a sound foundation in understanding human behavior and are inspired to improve their leadership abilities throughout their career in order to develop, plan, and implement national security policies. Additionally, graduates understand, embrace, and internalize the notion of officership and the role of the military in a democratic society. The cadets' achievement of the goal provides the Army and the Nation with graduates who:



Soldiers and Afghan National Police confer with doctors during an assessment of a clinic in Jaghuri, Afghanistan.

- Understand, effectively model, and communicate the role of the officer in a manner consistent with the professional identity of an officer and with the required roles as war-fighter,

servant to the Nation, member of a profession, and leader of character.

- Understand the multi-level process and values by which decisions are made within the democratic, constitutional structure of our political system. Accordingly, they realize how broader social, political, and economic contexts of American society affect their behavior as leaders and can apply that understanding to make necessary changes within their organizations.
- Understand that the behavior of political, social, cultural, ethnic, economic, and ideological entities at home and abroad influences both the structure and function of the military as well as the application of military force, and appreciate the strengths and weaknesses of the military as an instrument of policy for protecting national and societal interests at home and abroad.
- Understand and apply theories of individual, group, and societal behavior, especially in the context of the profession of arms. Furthermore, they have adopted a set of effective individual, group and organizational leadership skills and abilities that prepare them for professional responsibilities in diverse situations and contexts throughout their careers.
- Be self-aware and understand the origins of their own leadership style and how their personality and preferences affect their interactions with subordinates, peers, and superiors.
- Recognize and explain the differences among social, political and economic decision-making

processes at different levels, particularly how individuals, organizations, and societies make decisions to allocate scarce resources among competing demands.

- Synthesize the systematic study of human behavior with knowledge of cultural differences to understand how culture affects decisions.
- Recognize and effectively apply theories of human behavior particularly in the context of change, and become committed to life-long learning and inspired to apply new knowledge and information readily through reflection to their leadership behavior and professional responsibilities where appropriate.

The Learning Model

Structure of Cadet Experiences

Cadets progress through a series of challenging, intellectually energizing and diverse experiences that develop their ability to examine behavior at different levels of analysis—individual, group, organizational, societal, and global—with different contexts—social, political, and economic.

Their experiences emphasize purposive development in terms of both the processes of learning and of the content of different disciplinary perspectives. These experiences include a rich variety of challenges in which cadets have the freedom and opportunity to fail and learn from those experiences.

Understanding Human Behavior Goal Standard

Demonstrate ability to:	Goal Standard:
Demonstrate Officership	Graduates describe the self-concept of officership and the four identities of war fighter, leader of character, member of a profession and servant to nation, and are able to reflect on their own development consistent with their self-concept of officership.
Understand and Apply Decision-Making Processes	Graduates describe how the availability and allocation of resources and social norms and expectations influence the behaviors of people and the decisions of leaders.
Understand Contextual Effects of Human Behavior	Graduates have an appreciation for the varied nature of culture, can describe the key characteristics of culture and are able to generally describe the impact of culture on individual, organizational, social, economic, and political behavior.
Demonstrate Leadership	Graduates understand the importance of self-awareness, generally understand their strengths and weaknesses as a leader, can describe their developmental needs, and can describe their philosophy of leadership.



From humanitarian support missions in Pakistan (left) to stability operations in Iraq and Afghanistan, and even in the classrooms and the Central Area of West Point, Army officers are challenged to understand human behavior.

Within the constraints of a four-year curriculum, cadets' experiences sample from the various levels of analysis, learning processes, and disciplinary perspectives that provide appropriate levels of depth, breadth and integration.

Process of Cadet Experiences

Cadets master the process of individual assessment and feedback in seeking to enhance their on-going sense of self-awareness, and to focus motivation on self-improvement.

Cadets learn and demonstrate a comprehension of various theories of human behavior in order to develop a critical appreciation for the insights and limitations of these perspectives.

Cadets apply theories to practical applications, moving from an initial emphasis on understanding to a greater emphasis on application and evaluation.

Cadets analyze the complexity of human behavior and relationships across various contexts and levels of analysis. As cadets progress, they move from

single disciplinary perspectives to one analyzing behaviors with an interdisciplinary perspective.

Cadets develop a habit of reflection to “make sense” of their experiences and actively seek support and feedback for their personal and professional development, and understanding of human behavior.

Over the course of their development, cadets become increasingly sophisticated and precise in the synthesis and evaluation of material by presenting their analyses of human behavior through discussions, formal presentations, written essays, case studies and research papers.

Content of Cadet Experiences

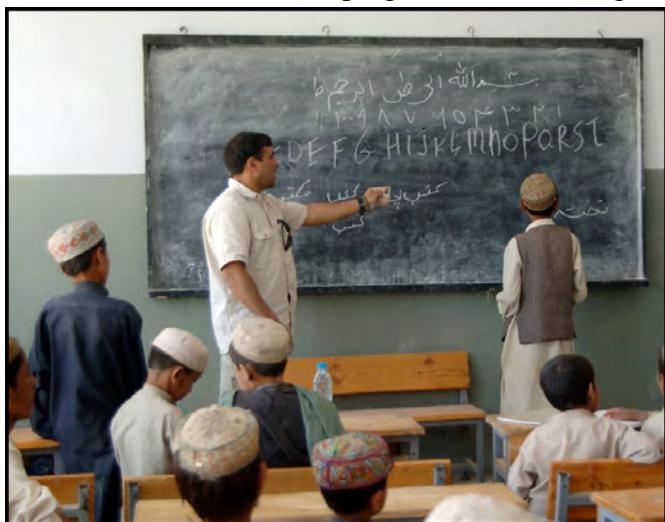
Because a wide variety of disciplines enhance the understanding of human behavior, cadets sample those disciplines to gain the greatest insights into purposive behavior. In order to make as much progress as possible in the limited time available, cadets proceed through a directed series of disciplinary experiences that build on earlier study where appropriate. The scope, theoretical foundation, and analysis of decision making define the content used for developing an understanding of



Cadets interact with their international counterparts to develop a deeper understanding of human behavior. Here two cadets pose on a T-72 with cadets from Uzbekistan’s Military Academy at Chirchik.

human behavior.

- The scope of human behavior reveals itself through the study of history, geography, and literature by emphasizing temporal, spatial, and cultural differences within American society and among other cultures of the world.
- Theories of human behavior emerge from the study of psychology, sociology, political science, economics, and philosophy by focusing on the nature of cognition, changing conceptions of the mind, and the social, political and economic contexts within which individual and collective human behavior occurs. The application of these concepts to effective leadership stands as a critical component of these courses.
- An understanding of decision-making processes at different levels grows through the study of economic, political, and social organizations within American society, the United States’ constitutional system, the military, and the global community.



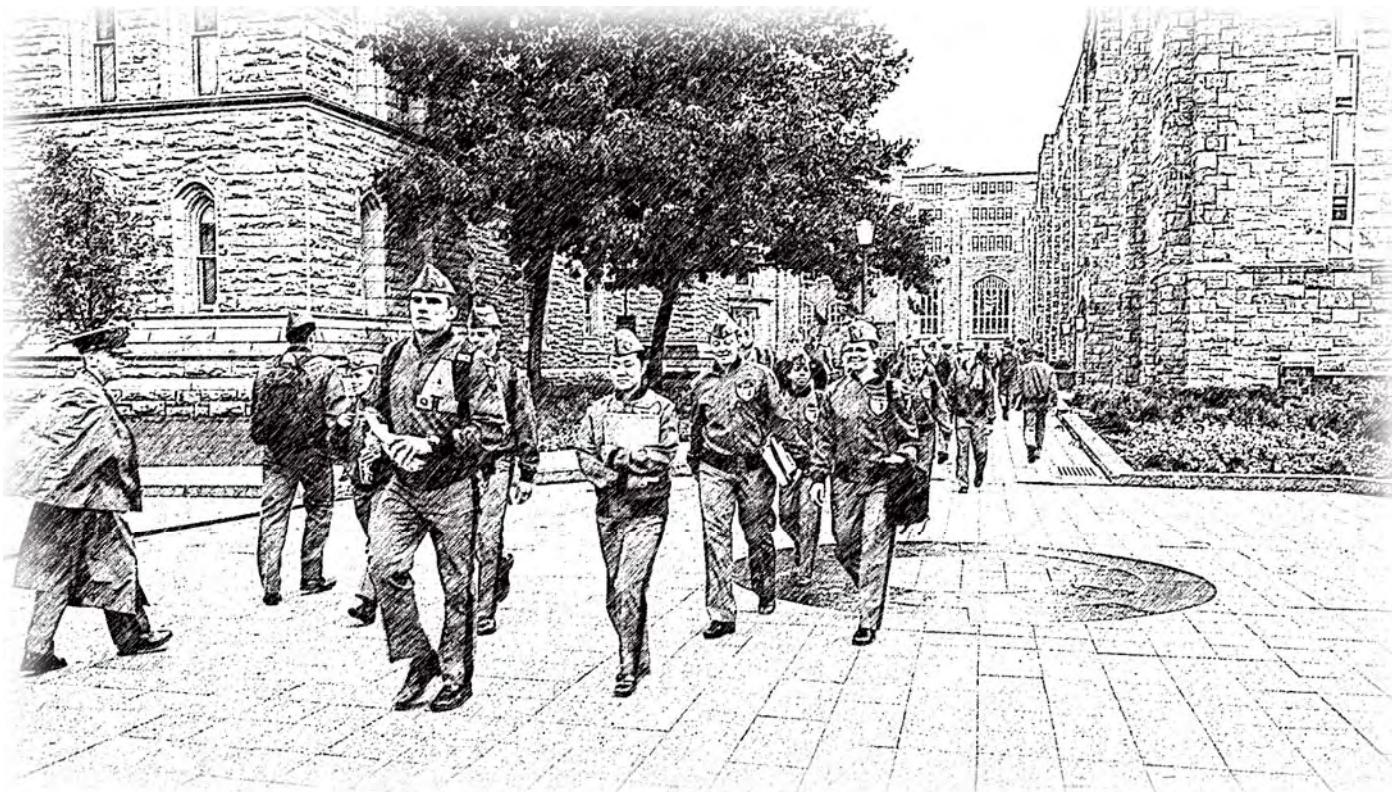
This school in the Andar province of Afghanistan was re-opened by U.S. Soldiers after it was closed temporarily by the Taliban.

Although cadet experiences generally build from an understanding of individual, organizational and societal behavior, cadets have a number of parallel experiences that require them to deal simultaneously with different levels of analysis and different goals. Cadets concurrently develop the tools of analysis used by each discipline when exploring various behavioral patterns, as well as an understanding of the strengths and weaknesses of these tools. Additionally cadets acquire an appreciation for employing an interdisciplinary perspective when studying social, economic, and political change.

These concurrent sequences must balance an understanding of both the substance (the breadth of human experience) and theories (frameworks for explaining that experience) most relevant to cadets' professional development. Such development builds on a study of the military as an organization, institution and profession — especially distinguishing

officers as members of a profession—in accordance with the developing concept of officership. Study in the relevant disciplines lead to an examination of major policy issues, particularly those involved with the military profession. Some issues addressed include the appropriate role of the military in American society, effective leadership in the army of a democratic nation, and the causes and conduct of war.

Key sequences of study include these progressions: from history to economics and American politics to international relations, military history, and law; and from psychology to military leadership, combined with integrating experiences in the military and physical programs. While these progressions clearly overlap, the strongest interconnections lie within each sequence. ★





Communication

Graduates listen, read, speak, and write effectively.

Rationale and Amplification

Competent officers have to be able to communicate effectively to accomplish a particular goal and to influence a designated audience. Effective communication is generally clear, precise, and concise—using a style appropriate to the meaning of the message and to the audience. As graduates anticipate and respond effectively to the uncertainties of a changing world, they encounter at least one certainty: the need to understand communications from others and to convey their own thoughts through oral and written means. Given that Army operations extend across a spectrum from peace to war, Army officers must be able to communicate with Soldiers, peers, and seniors. They must be prepared to communicate precisely with civil authorities, non-government organizations, local populations, forces from other countries, interpreters, and the media. They must be able to think critically about context and rapidly discern meaning from scenarios using their ability to understand, assess, and evaluate the communications of others. Officers must also be prepared to use and to further develop their foreign language proficiency.

What Graduates Can Do

Graduates listen actively, read critically, and understand the communications of others. They speak and write clearly, use style, vocabulary, and organization appropriate to the audience, and employ the standard conventions of educated



Officers must be able to cross language barriers, but also bridge cultural divides to communicate effectively. Here, a U.S. Soldier from a civil affairs and provincial reconstruction team talks with a tribal elder during village assessments in Nuristan Province, Afghanistan.

discourse. Conventions in written and oral communications include accepted rules of spelling, grammar, punctuation, format, attribution, and documentation. Graduates demonstrate in their

Educating Future Army Officers for a Changing World

writing the ability to find, evaluate, analyze, and synthesize information from appropriate primary and secondary sources. In their speaking, graduates use Standardized American English to express themselves clearly, adopting appropriate voice, tone, and level of formality. In reading and listening, graduates apply knowledge of style and genre to maintain an independent and critical evaluation and understanding of others' communication. Graduates know how to choose appropriate media to convey their meaning. Finally, graduates can manage basic communicative tasks in a foreign language.

When communicating, graduates can focus on a purpose; are aware that it usually takes multiple drafts to create and complete a successful, stylistically appropriate document. Graduates can develop flexible strategies for generating, revising, editing, and proof-reading; they understand that there are common formats for different kinds of texts; they practice appropriate means of documenting their work; they know or are able to find and use correctly the rules of Standardized American English; and they use a variety of technologies to address a range of audiences.

Communication Goal Standard

Demonstrate ability to:	Goal Standard:
Listen actively, read critically, and form an independent understanding of the communications of others	Graduates demonstrate in their writing the ability to find, evaluate, analyze, and synthesize appropriate primary and secondary sources; and demonstrate effective listening skills through evaluating others' oral communication.
Speak and write clearly, using style, vocabulary, and organization appropriate to the audience	Graduates respond to the needs of different audiences; respond appropriately and with substance to different kinds of rhetorical situations; use conventions of format and structure appropriate to the rhetorical situation in an organized way; use words with precision; and adopt appropriate voice, tone, and level of formality.
Correctly employ standard conventions in written and oral communications	Graduates can focus on a purpose; are aware that it usually takes multiple drafts to create and complete a successful, stylistically appropriate text; can develop flexible strategies for generating, revising, editing, and proof-reading; understand that there are common formats for different kinds of texts; practice appropriate means of documenting their work; know and are able to use correctly the rules of Standard American English; and use a variety of technologies to address a range of audiences.
Manage basic communicative tasks in a foreign language.	Graduates can accomplish basic tasks in the foreign language studied while at USMA.

The Learning Model

To provide positive models that they can emulate, cadets study a variety of genres, styles, and media as examples for seeing standards applied and for practicing basic skills. By reading, listening, and observing, cadets receive, understand, evaluate, and transmit ideas in a range of academic and professional settings. Cadets respond mostly in prose to academic requirements, but they also present orally and use other media, including play-acting, sculpture, photography, and personal video productions to transmit ideas.

USMA employs a cadet-centered communication model. Communication instruction is based on constructing meaning in learning groups, which involves settling on the conventions of grammar and usage using common handbooks and lexicons, and then coming to a shared understanding of meaning between writer and reader or speaker and listener using those widely accepted conventions. There is less reliance on authorial intent, though that is hardly dismissed. Active involvement of the reader or hearer is encouraged to develop meaning in participation and dialogue with the originator of the communication. Close reading of textual



Cadets are continuously challenged to develop their oral communication skills throughout the Academic Program.

material is appropriate, and textual analysis is an integral part of the development of an effective interpretation of written text, still images meant to persuade or inform, and moving and aural media.

Structure of Cadet Experiences

Effective communication at the Military Academy integrates four areas: substance, organization, style, and correctness. This framework applies to those who are charged with modeling effective communication for cadets, as well as to cadets who are improving their competence in communication. In the core program, cadets engage in communication about substantive issues early in order to develop their critical thinking skills. In terms of communicating, these skills are readily observable and testable: this is achieved formally and informally. The Advanced Composition course assessment is used to establish a baseline of what we do and how we determine that we do it, using the Communication Goal rubric.

In order to facilitate cadets' ability to engage substantive issues early, we have adopted a writing curriculum that moves quickly into critical reading and argumentative writing. Instructors in all disciplines consider the four elements in their evaluation of cadet projects:

Substance. This involves accurate understanding of communication from others. Appropriate selection of evidence to support argument. Factual accuracy, accurate interpretation and representation, and accurate attribution.

Organization. This implies an understanding of logic and the concepts of: coherence, conciseness, orderliness, soundness of logical relationships, completeness, method and form of presentation.



U.S. Army Soldiers meet with a local Mukhtar to discuss problems concerning his community in Al Wahida, Iraq.

Style. Understanding style in communication from others. Appropriate vocabulary, grammatical usage, logical organization, tone, and media for target audience.

Correctness. Understanding how communications are shaped by the standards of educated discourse. Spelling, grammar, punctuation, format, attribution and documentation format, in writing, appropriate to educated discourse.

Process of Cadet Experiences

- Departments and programs clearly articulate standards for substance, organization, style, and correctness for cadets and faculty that are appropriate for the discipline.
- Instructors evaluate cadet communication using increasingly demanding standards of substance, organization, style, and correctness.
- Cadets gain awareness of the importance of substance, organization, style, and correctness as they mature their own communicative skills. They increasingly recognize the importance of including these features in good communication.

- Cadets engage in listening and speaking in every course, daily in class discussions and often in formal presentations, under the guidance of instructors who attend to substance, organization, style, and correctness.

- Cadets read and write in homework activities, in quizzes and examinations, and in formal papers and reports that instructors evaluate on the basis of substance, organization, style, and correctness.

- By the end of their first year, cadets meet a college-level standard of basic proficiency in argumentative writing and establish their competence as writers ready to develop their skills in future undergraduate assignments.

- Cadets complete library research papers, technical reports, argumentative essays, and examinations, both oral and written, which challenge them to practice and improve basic skills.

- Cadets develop basic listening, speaking, reading, and writing skills in a foreign language. Cadets, while learning to express their thoughts clearly, correctly, and precisely in authentic cultural contexts in the foreign language, pay increased attention to the quality of their communication.

- As part of their engineering experience, cadets



We strive to expose our cadets to leaders in the field. Tom Brokaw addresses a group of cadets about communications in the news media.

Educating Future Army Officers for a Changing World

exercise and are evaluated on their use of communication skills in defining problems and articulating solutions.

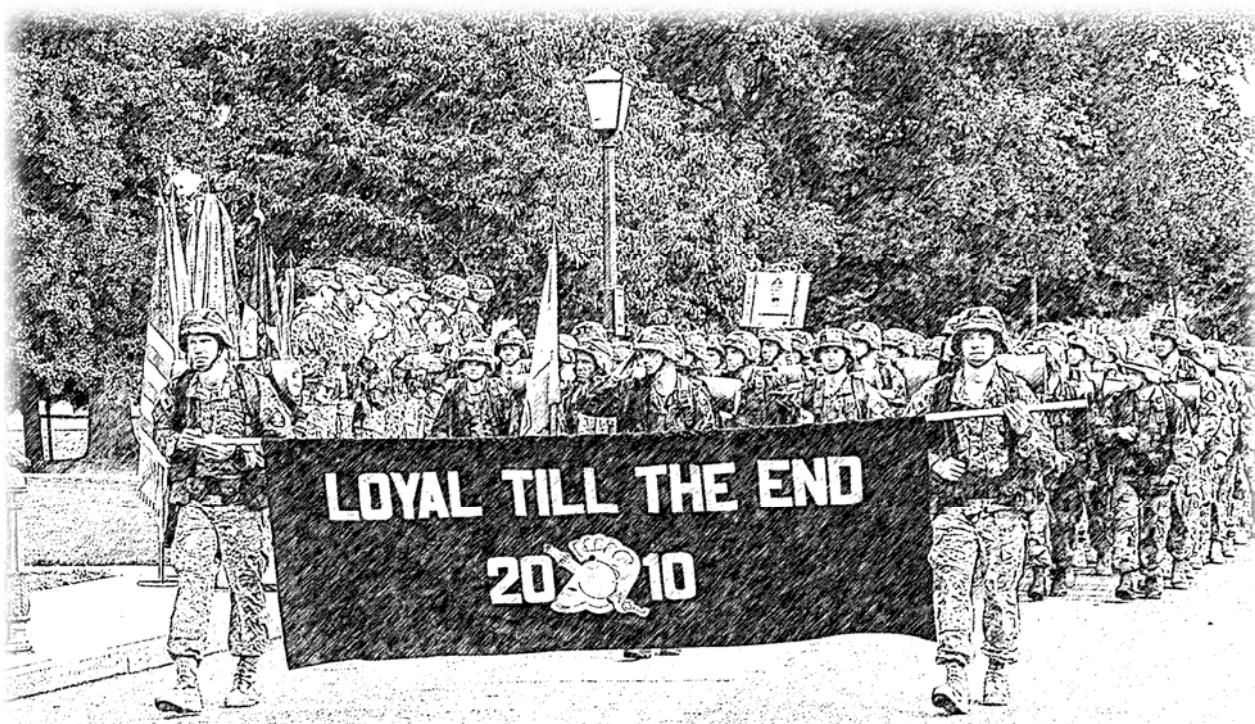
- Cadets acquire awareness of the range of communications media and the need to evaluate the appropriateness of each.
- Cadets use communication skills when they engage in the assessment that is part of their development as peer leaders.
- Cadets demonstrate successful attainment of the goal by reaching a level of excellence that satisfies USMA's expectations for a college graduate and an officer commissioned from West Point. They reach that level by the end of their sixth semester routinely and in special cases by the end of their seventh semester.

• By the seventh and eighth semesters of study, cadets integrate communication skills in accomplishing military and academic tasks of increasing complexity and depth.

• Cadet clubs and other extracurricular activities, although outside the classroom, also provide opportunities for the promotion and achievement of the communication goal.

Content of Cadet Experience

All courses incorporate communicative skills on a daily basis. Cadets acquire knowledge, skill, and understanding through effective listening and reading. They further refine and develop comprehension transmitting their ideas in speech and writing. ★





Creativity

Graduates think and act creatively.

Rationale and Amplification

The accelerating pace of global change has produced an international environment that is less stable and more unpredictable than ever before. World leaders at all levels confront a broad range of threats and military options. These conditions demand adaptive military leaders. Successful mission accomplishment also requires military leaders to possess the essential ingredients of creativity: creative and critical thinking, innovative problem solving, intellectual versatility, curiosity, and the ability to deal with ambiguity. In operations during both peace and war, the creative talents of our military leaders are crucial to the success of our armed forces.

Uninformed observers probably would not describe our modern Army as a proponent of creative thinking. To the contrary, the GI stereotype might lead one to believe that Army service involves mechanical obedience to specific orders: e.g., dig the trench, refill the hole, and repeat. In contradistinction to this stereotype, Army leaders, who function in a world of rapid technological, social, political, and economic change, must be astute thinkers and innovators.

Creativity, simply defined as "novelty that is useful," is the premier attribute needed to act effectively in our increasingly complex world. Our concept of creativity includes an interrelated set of intellectual skills and personal characteristics.

Personal characteristics include intellectual versatility, tolerance for ambiguity, willingness to take risks, open-mindedness, confidence, imagination, humility, and curiosity.

Intellectual skills include critical thinking, creative thinking, and innovative problem solving. Critical thinking involves careful and exact judgment, ultimately leading to a deeper analysis of an issue. The task of thinking critically promotes the development of intellectual humility, courage, empathy, integrity, and perseverance. The practice of critical thinking also fosters intellectual agility and versatility. Creative thinking includes consideration of a broad range of new, sometimes abstract, ideas and establishes new connections and relationships among these ideas. Innovative problem solving employs the intellectual skills and personal characteristics associated with creativity to confront even the most complex problems in an uncertain and dynamic world.

What Graduates Can Do

Graduates who achieve this goal willingly and confidently confront ambiguous situations. They apply their innovative ideas and thinking skills to solve problems. As they develop confidence in their ability to decide and act without perfect information, they also refine their ability to anticipate uncertainty.

Critical thinkers determine the credibility and utility of ideas and information. As critical thinkers,

Educating Future Army Officers for a Changing World

graduates determine what is known, unknown, and uncertain in a variety of contexts, and their discernment sets the stage for appropriate, effective, and innovative responses to complex issues.

As junior officers, graduates can accomplish their mission and take action when cut off from higher commands, or not provided specific guidance and direction. They are active, independent, and self-directed thinkers and learners who inspire, value, and integrate creative solutions from the soldiers they lead. They can transfer what they know in one context or discipline to another, as well as to new and different problems.

As innovative problem solvers, graduates respond to intellectual challenges that require critical thinking and creativity. When faced with complex

problems, they are able exceed traditional approaches, and devise useful solutions. As senior officers, they are active strategic thinkers and planners. They are able to work in collaborative teams, as well as individually, to confront ill-defined problems, to generate new ideas, and to function successfully in different settings. By developing themselves and educating others in creativity, they are effective leaders of military forces with increased flexibility and adaptability. In addition, they recognize the value of thinking and acting creatively and, thereby, establish productive environments in their units and organizations.

Creativity Goal Standard

Demonstrate ability to:	Goal Standard:
Willingly and confidently, confront ambiguous situations.	Respond to ambiguity by displaying curiosity, initiative, imagination, and persistence. In ambiguous situations, display the patience to tolerate the development of creative solutions. Exhibit self-confidence in their ability to decide and act without perfect information.
Apply innovative ideas and thinking skills to solve problems.	When confronted with problems, generate multiple independent ideas and evaluate them critically. Question assumptions. Seek innovative solutions and take the risks required to produce such solutions.
Transfer what they know in one discipline to another, as well as to new or different problems.	Recognize novel problems. Learn efficiently by transferring what they know in one field to a new field. Demonstrate the ability to apply what they know across disciplinary boundaries.

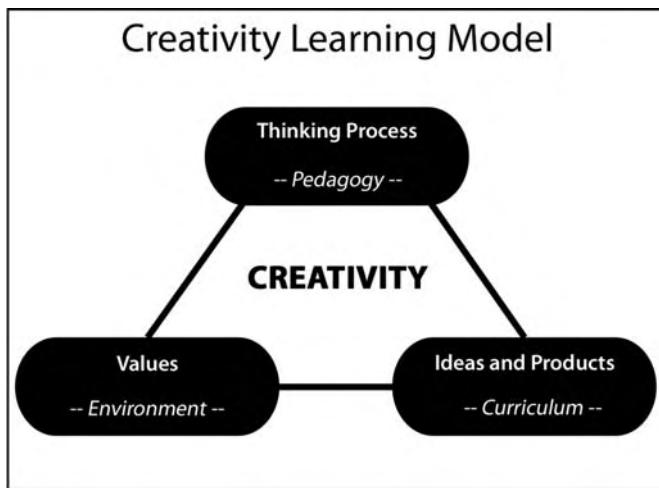
The Learning Model

An expert problem solver must be endowed with two incompatible qualities, a restless imagination and patient pertinacity.

Howard H. Eves, 1969

In our world of accelerating change, intensifying complexity, and increasing interdependence, thinking and acting creatively are necessary. The learning model involves the environmental, curricular, and pedagogical dimensions of the Academic Program. The foundation for the development of creativity is established through a learning *environment* that values and rewards curiosity, questioning, and risk taking. USMA faculty encourage cadets to present, discuss, and debate their own ideas. From a *curricular* perspective, cadets develop creativity in courses that require extensive reasoning and problem solving skills where the use of imagination, versatility, and enthusiasm are required to produce effective ideas and solutions. We foster creativity further through a *pedagogy* characterized by interactive and engaging teaching styles that develop the cadets' creative and critical thinking processes. The following framework shows these three developmental aspects of creativity.

Environment



Cadets are expected to express creativity in a number of venues during their academic experience at USMA.

There is no science without fancy and no art without facts.

Vladimir Nabokov

Effective officers unleash and channel the creative potential of Soldiers in their charge. The Cadet Leader Development System attempts to strike an appropriate balance between fostering innovation and promoting internalization of professional norms. The West Point experience begins with Cadet Basic Training, a transformational experience that tends to emphasize conformity over creativity. For example, New Cadets must react to a variety of questions and situations with a predetermined and well-defined set of responses. During the 47-month cadet experience, CLDS aims to transform these followers, who employ templates in simple situations, into leaders who apply principles to increasingly complex circumstances. Critical thinking skills and creative solutions thus become more important as cadets assume the mantle of leadership. Graduates embark on a similar developmental path in the Army as junior officers, who grapple with the rules, then mature into senior officers who manage the exceptions.

The Cadet Leader Development System provides opportunities for developing and exercising creative thought as cadets move through the core curriculum to their chosen major. The broad-based core requirements, combined with the major, offers cadets a variety of disciplinary and interdisciplinary perspectives. We educate cadets in an academic context that supports and values curiosity, imagining, exploring, questioning, and risk taking. We encourage cadets to take advantage of opportunities to present, discuss, and debate ideas. Academic resources, such as Internet access, availability of a variety of newspapers and journals, and a high quality, undergraduate library, contribute to the supportive environment, which fosters the development of creativity.

Curriculum

The mind uses its faculty for creativity only when experience forces it to do so.

Jules Henri Poincaré

Creativity is developed over the four-year academic experience. The curriculum requires cadets to develop new ideas and to create new products. Elements of the core curriculum that make significant contributions to this goal are:

- The curriculum sparks cadets' imaginations and develops their curiosity by exposing them to a wide variety of challenging subjects.
- Sequential learning in a discipline leads cadets to more sophisticated understanding that encourages and requires leaps of the imagination to synthesize and apply their knowledge.
- The cadet experience contains many courses wherein reasoning, writing, and problem solving require cadets to use imagination and innovation.



The award-winning USMA Model UN Team in China.

- Many projects and laboratory requirements demand that cadets cope with ambiguity and explore alternatives to discover solutions or produce new products.
- Cadets learn the art and structure of technical problem solving in a variety of disciplines including computer science, mathematics, science, engineering, and social science.
- Interdisciplinary projects and activities demand the application of intellectual versatility and curiosity to transfer cadets' learning from one context or discipline to another.
- The humanities specifically teach critical thinking and logic through the study and analysis of the different viewpoints of major philosophical, historical, and cultural issues.
- Engineering design projects and research papers require significant creativity.
- Integrative experiences in each major require cadets to think and act creatively by dealing with complex problems.

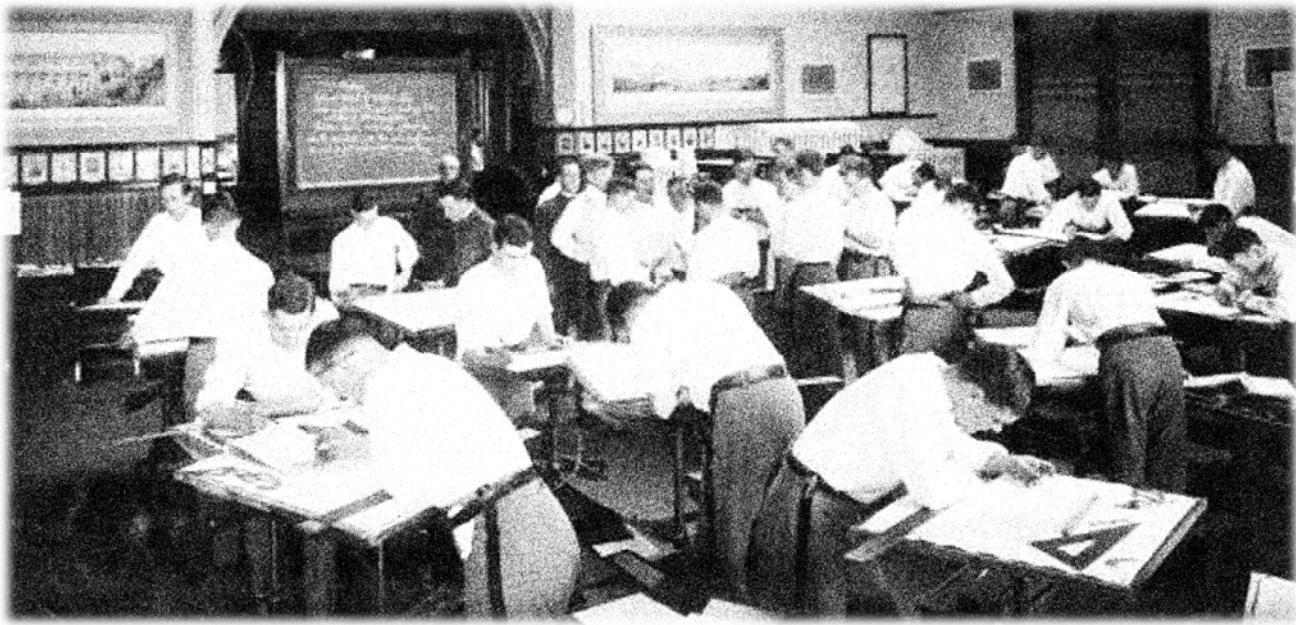
- Many disciplines have a culminating experience that involves intellectual versatility and extensive critical thinking.

Pedagogy

Eureka. -- Archimedes

Creativity is an indispensable element of the active learning environment both in and out of the classroom. One way to establish an interactive and engaging learning environment is to encourage questioning and discussion. Question-based pedagogy recognizes that questions, not answers, are the driving force in thinking. When answers generate further questions, important thinking and problem solving occur. The USMA program provides the necessary breadth to gain new

perspectives to develop creative thinking skills and the opportunities for in-depth study to develop critical thinking skills. Cadets who develop curiosity and ask questions during their academic pursuits are thinking and learning. USMA faculty, who serve as role models of critical thinking and creativity, make use of classroom and homework activities to establish this interactive environment and to promote active learning. A program of distinguished guest lectures provides cadets with access to many of the most creative thinkers in their respective disciplines. The interactive system used at USMA contains frequent use of activities, questioning, and discussion. This active learning establishes a pedagogical system that promotes critical thinking and creativity. ★





Moral Awareness

Graduates recognize moral issues and apply ethical considerations in decision-making.

Rationale and Amplification

This goal enables cadets to develop a professional identity. In pursuit of this goal, cadets are encouraged to integrate their personal beliefs with the Army's professional values (i.e., loyalty, duty, respect, selfless service, honor, integrity, and personal courage) in order to become commissioned leaders of character.

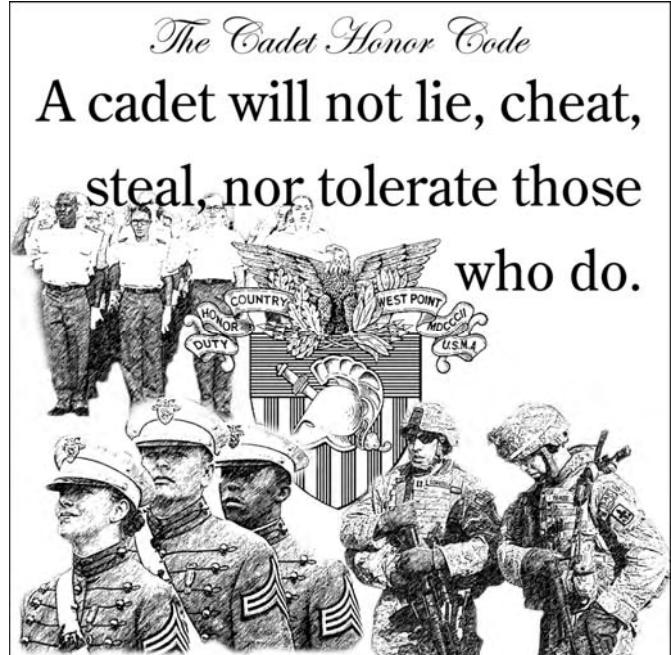
This goal describes the intellectual component of the Military Academy's moral development curriculum, which spans CLDS. The goal calls for an academic curriculum in which cadets recognize moral issues, account for applicable ethical considerations, and produce well-reasoned responses. To that end, we assemble a faculty that itself marks moral issues and insists that cadets also note them, no matter the specific academic context. We assign work that entails sound ethical analysis leading to well-reasoned decisions.

Success does not guarantee that cadets will always exercise their moral insights and apply their ability to reason ethically. Therefore, the Physical and Military Programs, the Honor System, Values Education, mentor activities, and chain of command responsibilities push cadets into further discussions of moral issues and often require them to act publicly in moral situations. Cadets cannot escape encountering ethical discourse during their West Point experience. The Cadet Leader Development System helps cadets engage meaningfully with their emerging understanding of officership.

By attaining this goal, cadets strengthen the likelihood that they will fulfill the Army's expectations. They develop their ability to examine ethical issues in ways that go beyond superficial analysis. This is essential because the Army of the 21st Century will count on West Point to furnish leaders of character, officers who recognize the moral complexity of life, reason soundly about ethical matters, act on their moral convictions, and understand the moral implications of their professional obligations.

What Graduates Can Do

Graduates can identify and examine moral implications of ordinary and unusual situations.



The Cadet Honor Code forms a basis for identifying and examining moral issues at West Point and beyond.

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They can analyze rationally particular ethical responses to moral problems, especially those common to the military profession. Graduates routinely can recognize the moral issues in their units, help other people gain an understanding of the issues, identify and assess morally justifiable actions, and draw upon a sound ethical foundation in deciding how to fulfill their professional

responsibilities. Because officers serve as exemplars and teachers carrying ever-greater responsibility over time, West Point graduates can strengthen the intellectual ability of the Army to analyze rationally specific ethical responses to moral problems, especially those common to the military profession.

Moral Awareness Goal Standard

Demonstrate ability to:	Goal Standard:
Identify and examine moral implications of both ordinary and unusual situations	Graduates understand that their duty requires them to reflect on the moral implications of situations they encounter on and off duty.
Analyze rationally specific ethical responses to moral problems, especially those common to the military profession.	Graduates look at the consequences of various responses to moral problems and analyze them in terms of logical consistency, conduciveness to the success of the mission, and consistency with the highest ideals of the country as articulated in the Constitution.
Recognize the moral issues in their units, help other people gain an understanding of the issues, identify and assess morally justifiable actions, and draw upon a sound ethical foundation in deciding how to fulfill their professional responsibilities.	Graduates identify moral issues and work with others to find reasoned, ethical solutions to problems.
Strengthen the intellectual ability of the Army to analyze rationally specific ethical responses to moral problems, especially those common to the military profession.	Graduates identify the tactical or strategic importance to mission accomplishment of responding ethically to moral problems.



The Learning Model

Cadets encounter experiences planned to invite informed moral discourse. Cadets encounter faculty who are prepared to discuss moral issues with them as appropriate. Successful responses by cadets to the experiences provided by the learning model ensure that they satisfy the moral awareness academic program goal.

Structure of Cadet Experiences

The Cadet Leader Development System specifies a three-part structure to the development of moral awareness:

- Recognition: identification, description, and analysis of moral issues.
- Moral Considerations: ethical options, counterarguments, soundness, reasonableness, and implications of competing views.
- Application in Decision-Making: cogency, coherence, and consistency of ethical considerations to the moral issue at hand.

Process of Cadet Experiences

From the cadet's first introduction to the curriculum, instructors assume that they share a common understanding of American cultural values and some understanding of the terms of moral discourse. Thus, initial discussions regarding issues of moral significance center on recognition of the issue, the various moral considerations, and the ways in which ethical responses affect decision-making. Because we recognize that cadets come from diverse backgrounds and have diverse views about the requirements of moral awareness, discussions also must examine moral motivation:

we must emphasize *why* cadets should act ethically, especially in the execution of their professional obligations. The substance of issues can arise out of any academic discipline from chemistry to computer science, foreign language to engineering. Certain core courses guarantee particular experiences for all cadets. Elective courses as well often arouse intensive, detailed examination of ethical issues.

Cadets are encouraged to recognize that people of character routinely find themselves debating moral questions. Even faculty members, all of whom embrace a common goal and share a great many moral values, must expect to disagree. Cadets confront the argumentative nature of moral discourse in the context of an awareness of the complexity of moral problems. What are the facts of the case? Which moral considerations, if any, apply to the facts? What responses are morally acceptable? Which moral responses have the greatest merit? Cadets recognize that in some situations well-intentioned people may disagree. However, they also discover that some analyses are factually and logically better than others. They



The adherence to moral and ethical standards does not end upon graduation because those standards are one of the bedrock foundations of the Army value system.

discover that they can answer moral questions that they can revise and refine their answers, that they can change their answers, and that they can strengthen their answers by listening to the answers of others. They know that the world they will enter requires answers that they must be able to present and defend intellectually. At West Point, they learn to shape and justify substantial moral positions as part of their lifelong struggle with the elusive world of ideas.

Content of Cadet Experiences

Cadets engage appropriate scholarly standards for documentation of written work, understand the reasons for the standards, and practice full and complete documentation.

Cadets know and observe fair rules governing their conduct during tests and examinations.

Cadets complete core courses that affect their moral awareness by:

- developing an awareness and understanding of their own behavior and the behavior of others.

- studying the constitutional foundations of American government and actions of the body politic.
- engaging in critical thinking, the study of ethical theories, analysis of moral issues, especially those involving war, and moral discourse.
- considering the role of society in war.
- considering the role of the military in society.
- justifying the morality of engineering decisions in regard to their possible effects on people and the environment.
- studying the leader's influence on individuals.
- analyzing the behavior of states.
- examining the uses of law, the limits of law, and role of law in society, with emphasis on the Constitution and the military justice system.
- examining the distinction between legality and morality. ★





Continued Intellectual Development

Graduates demonstrate the capability and desire to pursue progressive and continued intellectual development.

Rationale and Amplification

Because it is not possible to anticipate all of the demands that graduates will face, and because it is not possible for the Army to train its officers to handle every conceivable challenge, USMA graduates must be motivated and equipped to learn on their own. They must understand that their undergraduate education is not an end in itself; rather, it is a foundation upon which they will build their professional expertise. Our graduates must be willing to learn new ideas, methods, and technologies. Such capabilities result from the breath of the core program, from specialization in a major, and from the inspiration and confidence stimulated by an integrative experience.

What Graduates Can Do

Graduates achieving the goal have the foundation for continued intellectual development and the willingness to pursue learning on their own. They are prepared to study a variety of subjects, and they comprehend diverse strategies for recognizing and solving problems. Similarly, they are prepared for advanced study in a variety of subjects of interest to the Army and themselves. Furthermore, they understand the challenges of pursuing new subjects. As they consider new issues, they know how to assess ideas and information and form opinions on their own. Graduates know when they need information and appreciate how to obtain, evaluate, transform, and use this information effectively.



Through annual interviews, battalion commanders indicate that West Point graduates demonstrate a strong interest in improving their skills and knowledge base, as well as a high aptitude for integrating new learning in daily operations.

Additionally, they can assess realistically their comprehension of a subject and address shortcomings. Such capabilities enable graduates to continue their intellectual development and enhance their ability to contribute effectively over a lifetime of service to the Nation.

The attainment of this goal enhances the development of future Army leaders by producing graduates who possess the desire to engage in and persist at complex tasks. They are flexible and open-minded learners. As critical thinkers, they have the ability to:

- Define issues.
- Recognize stated and unstated assumptions.

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- Recognize the need for and be able to find and evaluate pertinent information.
- Formulate and select relevant and promising hypotheses.
- Evaluate hypotheses and draw valid conclusions.
- Use these conclusions as the basis for future exploration of related issues.

These desired outcomes form the basis for assessment of this goal.

The Learning Model

The Structure of Cadet Experiences

The Intellectual Domain of the Cadet Leader Development System contributes to cadet achievement of this goal. The core curriculum provides a broad base of knowledge, while the major enables cadets to explore a subject in depth.

Core and elective courses acquaint cadets with self-directed learning, thereby providing the foundation for learning on their own. As cadets progress through the core and major programs, they assume greater responsibility for exploring topics independently. In addition to critical thinking skills, cadets develop information literacy by learning to recognize the need to obtain, evaluate, transform and use that information effectively.

The Process of Cadet Experiences

Cadets achieve this goal by their immersion in an environment that fosters a sense of self-directed learning. As cadets progress through the four-year experience, they absorb perspectives from a variety of disciplines, learn diverse problem-solving skills, and function as self-directed learners. Over time, they assume greater responsibility for their learning, and they produce progressively more original products from increasingly critical and creative thinking.

Continued Intellectual Development Goal Standard

Demonstrate ability to:	Goal Standard:
Graduates demonstrate ability to learn on their own.	Graduates <u>assess</u> ideas and problems and <u>form opinions</u> using critical and creative thinking skills. Graduates assess ideas and problems by defining the issue; by recognizing stated and unstated assumptions; by recognizing the need for pertinent information and by finding and evaluating that information; by recognizing and addressing their shortcomings at comprehending a subject. Graduates form opinions by formulating relevant, diverse, and promising hypotheses; by evaluating hypotheses and drawing valid conclusions; by using the conclusions as the basis for a solution and future exploration of related issues.
Graduates seek advanced study in areas of professional or personal interest and pursue subjects in depth.	Graduates express interest in additional learning opportunities; recognize when additional information is required to master a subject; understand the frontiers of knowledge in chosen area of study and the process to extend those frontiers.

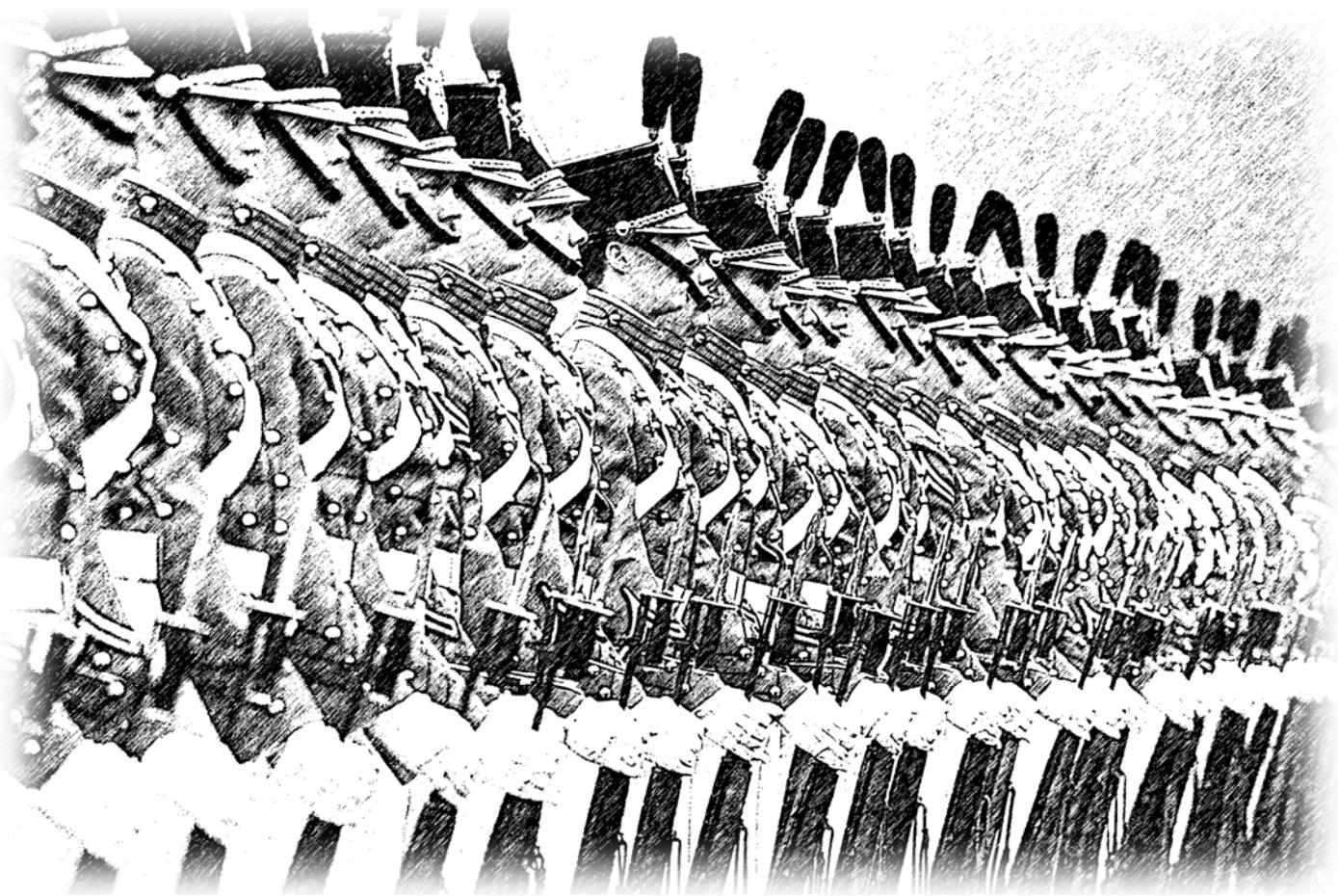
The Content of Cadet Experiences

The Cadet Leader Development System provides an environment that supports and nurtures learning. The core curriculum builds breadth through a wide range of academic subjects that help cadets develop diverse problem-solving skills. In the majors program, cadets assume greater responsibility for exploring topics on their own. As they progress through these experiences and learn how to form questions, make judgments, and solve problems using techniques from the various disciplines, cadets establish a broad intellectual foundation.

By pursuing a specific discipline, cadets acquire a more sophisticated understanding of the challenges

and rewards of studying subjects in depth. They realize that they cannot know everything about a subject, but their desire to learn should be heightened by their deeper study of a discipline. Moreover, their encounters with more sophisticated questions or challenges enable them to understand new ideas and respond creatively to problems.

The integrative aspect of the Intellectual Domain encourages cadets to employ alternative perspectives in evaluating, selecting, and using ideas and information in order to solve complex problems. Throughout the curriculum, cadets develop their critical thinking skills. They form opinions and make assessments on the basis of exposure to a broad array of ideas. ★





Goals, Curriculum, and Assessment

The Curriculum

While many excellent colleges have educational goals similar to those of the United States Military Academy, our mission adds a dimension that makes West Point unique. As the sole institution of higher education in the Nation whose primary responsibility is to educate cadets for career service as professional Army officers, West Point incorporates a dynamic, challenging, and integrated curriculum, organized around a set of interdisciplinary goals drawn directly from Army needs. Toward this end, one critical purpose of our curriculum is to establish the intellectual foundation for service as a commissioned officer and, like other aspects of the West Point experience, it is designed to inspire and foster development in leadership, moral courage, and integrity.

To meet the Army's needs, the USMA curriculum stresses the acquisition of knowledge and the development of higher-order cognitive skills. West Point's curriculum offers interdisciplinary opportunities for analyzing, problem solving, and decision-making that are fundamental to successful performance of duty as a commissioned officer.

West Point was the first of the service academies to be established by Congress and the first engineering school in the country. Since its founding in 1802, the United States Military Academy has produced

officer-leaders who serve the country honorably and with distinction. With USMA's focus on service to the Nation, the curriculum has historically been modified to meet the anticipated needs of the Army, the Nation, and consistent with the rigors of higher education. The curriculum, which was once almost exclusively focused on civil engineering to provide the foundation for service in the Corps of Engineers and Field Artillery, now balances the physical sciences and engineering with the humanities and social sciences to establish the educational foundation for commissioned leadership in the 21st Century Army.

The diversity of tasks undertaken by the Army requires leaders whose education is solidly grounded in the social and physical sciences. These requirements, and the accumulated experience of two centuries of preparing officers to meet the Army's needs, support the retention of a broad core curriculum, one that meets the multiple challenges of ethical service and provides cadets with the foundation for continued professional development.

The curriculum has two principal structural features. The first is a broad set of core courses, which provide an intellectual foundation for service as a commissioned officer. These core courses, along with Military Science and Physical Education classes, constitute the Military Academy's

“professional major.” The second is a set of concentrated elective courses in a major, which provide cadets with the opportunity to specialize in a discipline of their choice. Upon completing the requirements of these programs, all cadets receive a Bachelor of Science degree.

The ten Intellectual Domain goals are not found in any specific course, but rather are embedded within the curriculum across the core courses and major. In contrast, the Overarching Goal is primarily situated in a culminating experience provided by a

course in each major during the First Class Year called the Integrative Experience. This course is designed within a major and tailored to allow cadets an opportunity to demonstrate the sum of their intellectual West Point experience accumulated across the core courses and major elective courses.

As one of the oldest public institutions of higher education in the Nation, the United States Military Academy maintains a commitment to educational excellence. Today, West Point exceeds the highest standards in collegiate education.

Assessment System

Purpose of Assessment

Curricular review and renewal at USMA is managed principally through an informed, systematic process. Accordingly, the curriculum maintains currency and relevance to the Army and higher education. To enhance cadet learning and development, our assessment system yields useful information that allows us to measure the Academic Program’s outcomes and to respond to inquiries from external agencies including the Department of the Army, the Department of Defense, the United States Congress, the Middle States Commission on Higher Education, and the Accreditation Board for Engineering and Technology.

Principles of Assessment

Six principles guide our design of the assessment system to ensure that it is effective, efficient and empirical. The two principles of effectiveness direct that our assessment initiatives are *goal based* and *responsive to decision-makers* to maximize accountability and continually improve the Academic Program. We integrate these principles into other academic functions, including curriculum design and instruction.

The two principles of efficiency direct that assessment initiatives *maximize the use of existing indicators embedded in ongoing educational activities* in order to *minimize disruptions* to existing functions and structures. We avoid importing external assessment instruments, procedures, or organizational structures, opting instead for the development of assessment procedures that fit our unique mission and goals.

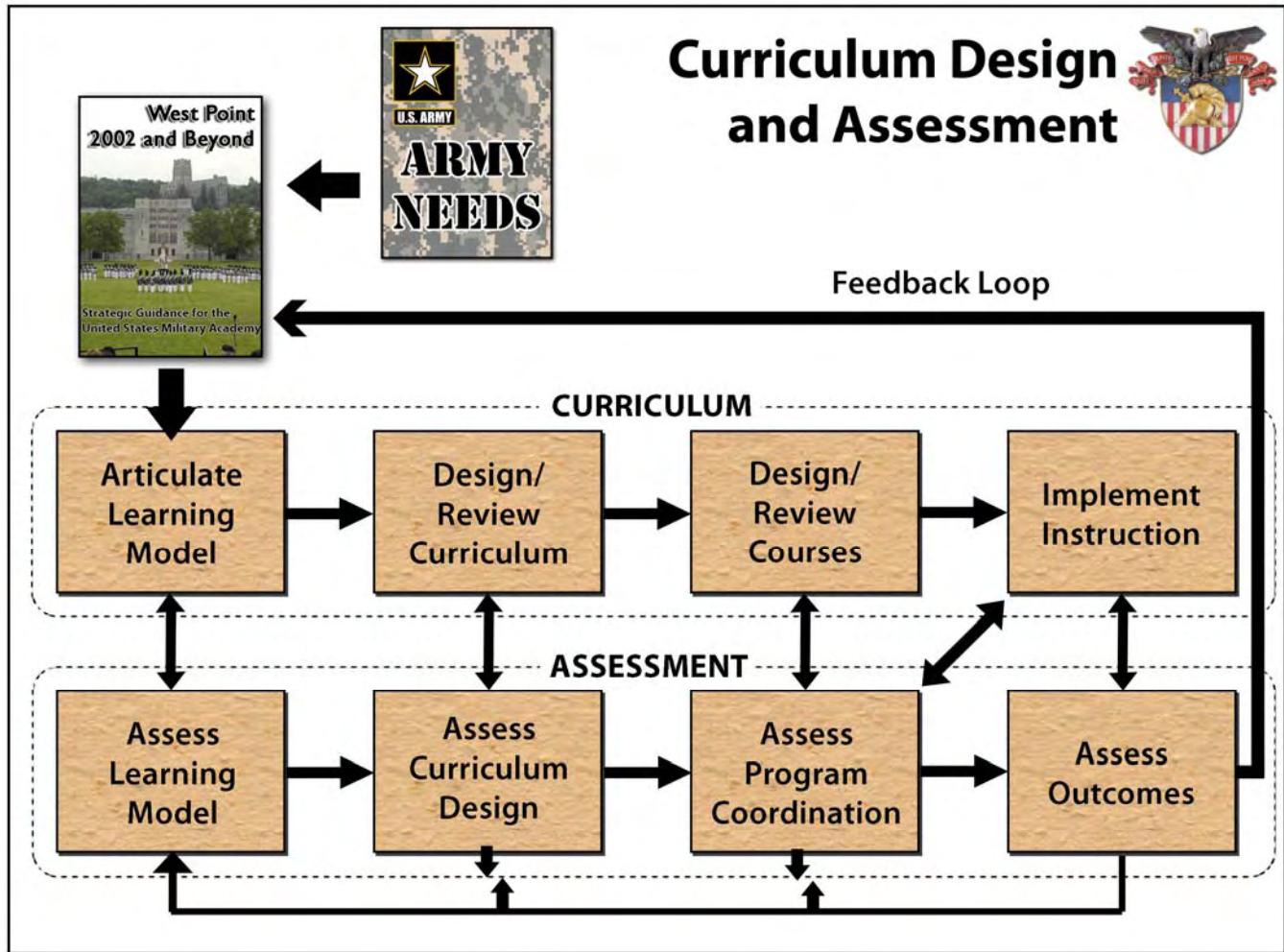
The final two empirical principles relate to measurement. We emphasize the use of *multiple measures* at *multiple points in time* to reduce the effects of measurement error and to increase the validity of inferences about academic progress. These measures reflect direct (e.g., analysis of cadet products embedded in course work) and indirect (e.g., surveys and interviews) indicators of cadet achievement of the goals.

Design of our Assessment System

Assessment is a fundamental part of the Academic Program. The assessment system informs and is informed by decisions regarding other academic functions. Assessment outcomes support decisions regarding curriculum structure, course design, and

course integration. Similarly, results offer input into decisions about the content and sequencing of faculty development activities that focus on creating and maintaining a cadet-centered learning environment. Furthermore, assessment results

inform USMA decision makers how well we are doing in meeting educational goals and point to areas in the Academic Program that require greater attention.





Group projects and collaborative learning are important components of a West Point education.

Assessment at West Point has four distinct processes that, taken together, integrate curriculum, instruction, and cadet achievement into a conceptual framework that is consistent with the Military Academy's goals. These four processes are: assessment of the learning model, review and evaluation of curricular design, inspection and oversight of curricular implementation, and measurement of cadet goal achievement.

Assess Learning Model: The first assessment process relates to curriculum design. Curriculum design proceeds from a learning model for each academic program goal. This learning model represents a theory about how cadets learn and develop with respect to particular types of educational outcomes. With a constant eye on supporting Army needs, learning models are derived in general from established theory and practice in higher education and in particular from the features of the disciplines that support specific goals. They provide a conceptual foundation to guide the selection and arrangement of experiences (e.g., courses in a curriculum) that are intended to promote achievement of educational goals.

At a minimum, assessment of a learning model involves a periodic review of the model in light of

relevant educational trends and locally obtained assessment results. These assessment efforts provide a test of the model.

Assess Curriculum Design: In concept, articulation of a learning model occurs prior to program design, providing a basis for its organization that includes the selection of specific courses in a curriculum. A curriculum should conform to the articulated learning model, but the degree of specificity may vary from one content area to another.

Curriculum design assessment incorporates a peer review process to determine if a cluster of courses, or program threads, satisfies one or more of the Cadet Leader Development System goals. Using the learning model as a conceptual framework, reviewers determine the overall fit of the courses to the program goal through an examination of course objectives, substantive content, and interdisciplinary linkages among courses. This requires a close inspection of the course objectives for those identified as contributing to a particular academic program goal and a determination of their ability to satisfy the elements of the learning model.

Assess Program Coordination: Course design and delivery of instruction logically follow from curriculum design. Course design includes the

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specification of course goals and objectives, the selection and sequencing of course content, the selection or preparation of instructional materials, the design of tests and other student-evaluation instruments, and the development of instructional strategies and lesson plans. The pedagogy includes instructing and evaluating cadets, giving them feedback, and providing remediation.

What is involved in the assessment of curriculum coordination? At a minimum, our efforts in this area include a review of course syllabi, instructional materials, pedagogical practices, and student assessment methods to determine if aspects of these courses align with the intended goal. Our emphasis on the assessment principles encourage input from multiple sources, including students, faculty from within USMA, and experts from beyond the Military Academy. Assessment methods include an analysis of course products, student surveys, and classroom visitations.

Assess Outcomes: Assessment of goal achievement—what has been commonly termed “outcomes assessment,” requires that a learning model be in place, that a curriculum be designed in accordance with the learning model, and that the curriculum be implemented in a manner consistent

with the learning model. Without these conditions, interpretation of outcomes data is problematic because no conceptual basis exists for making sense out of assessment findings.

Feedback Loop: An assessment system is stagnant if the results are not used in a meaningful way to monitor quality and improve the achievement of the outcomes. Assessment information needs to be summarized, analyzed and presented to the appropriate audiences with an eye not just to evaluate, but also to implement improvements. We accomplish this in three primary ways. First, the goal teams have faculty members involved in the delivery of instruction in the courses identified as contributing to the outcomes of the goal. Faculty at the implementation level are on the front lines of instruction and in positions to affect changes as the goal teams identify concerns. Second, each goal team produces an annual report summarizing the results of the assessment activities, which includes recommendations based on their findings. Finally, the Assessment Steering Committee solicits and reviews proposals for curricular changes based on assessment findings, changes in higher education, or changes in the Army requiring our adaptation, and makes recommendations to the Dean.



Opportunities for active learning are provided throughout the USMA experience.

Implementation of Assessment

While the components of this assessment system are currently in place at West Point, some of the CLDS domains are comparatively further along in the process. The Intellectual Domain, through the auspices of the Assessment Steering Committee, has been working on refining assessment for approximately 15 years. Goal teams incorporate goal standards to guide assessments of cadet outcomes. Several embedded indicators have been identified in coursework for each outcome statement representing each goal. Goal teams have collected data from a variety of embedded indicators including tests, performance outcomes,

and course products at several points in time. Consistent with the assessment principles, we combine the data on student performance with measurements from surveys of cadets and graduates, as well as from interviews with battalion commanders.

An assessment of the Intellectual Domain's Overarching Program Goal provides an illustration of the implementation of this assessment system. The Assessment Steering Committee developed the rubric below for assessing the goal, based on the overarching goal standard. Integrative experiences representing several distinct fields were assessed against the rubric.

INSTRUMENT FOR ASSESSING ACHIEVEMENT OF THE OVERARCHING GOAL		Unsatisfactory	Marginally Unsat	Marginally Sat	Good	Excellent	REMARKS
Based on a Cadet Product from the Integrative Experience							
Graduates anticipate uncertainties, including challenges, problems, and opportunities.							
The cadet or project team demonstrates							
an ability to scan the social, political, economic, and technological domains of the environment to identify trends, interactions, and new ideas.							
an ability to identify one or more problems drawn from the situation.							
an ability to understand the uncertainties inherent in the problem.							
an awareness of limitations the cadets have in engaging the problem.							
Graduates respond effectively to uncertainties with confidence and reasoned judgment.							
The cadet or project team demonstrates							
awareness of the breadth, depth, and limits of their problem or situation.							
an ability to frame the problem (to include identifying concepts central to the problem or situation, examining underlying assumptions, and considering multiple perspectives and analogous historical situations.)							
an ability to understand the interactions among relevant technological, social, political, and economic aspects of the problem.							
an ability to identify a set of plausible, discernible, and/or alternative options (to include military options, if appropriate)							
an ability to use evidence to make a well-reasoned decision.							
an ability to consider potential second-order effects of this decision.							
an ability to persuasively communicate both the decision and its basis.							

For example, in the Physics integrative experience course, Science and Policy, the embedded indicator was a policy paper. The guidance given to cadets stated that the purpose of the policy paper was to “persuade a decision maker ... to accept your recommendation for an appropriate U.S. policy. ...your paper must ...describe the status quo, must identify key factors-political/social, economic, and scientific/technological-that bear on the problem, must outline appropriate policy options, and must culminate in a well-argued recommendation.” Faculty using the rubric produced results showing that the structure and format of the policy papers allowed the instrument specific rubric to be applied easily to the embedded indicator, and that the

format of the policy paper and guidelines could be fine tuned to identify weaknesses in the recommendations made in the policy papers. Based upon the results of this assessment, cadets appear to be achieving the Overarching Goal.

When considered within the context of the findings from all scheduled embedded indicators, this data provides a rich source for assessing cadet achievement of the Overarching Academic Program Goal. USMA is building on these efforts to focus directly on the other CLDS domains in a effort to assess systematically all six domains. We believe that a true operational concept for the Academic Program will contribute to all if not all of the domains.★





Educating Future Army Officers for a Changing World

3d Edition

The operational concept for the Intellectual Domain at the United States Military Academy is a living document, and will be reviewed and revised at regular intervals. This, the 3d edition, replaces the 2002 version of Educating Future Army officers for a Changing World.

More information on the Intellectual Domain and curriculum is available on our website: <http://www.dean.usma.edu>.



The United States Military Academy is accredited by the Middle States Commission on Higher Education. The Academy's engineering and computer science programs are accredited by the Accreditation Board for Engineering and Technology.

Comments and recommendations for revision are invited and should be sent to the Academic Affairs Division, Office of the Dean, Building 600 Room 10, United States Military Academy, West Point, NY 10996-5000.

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