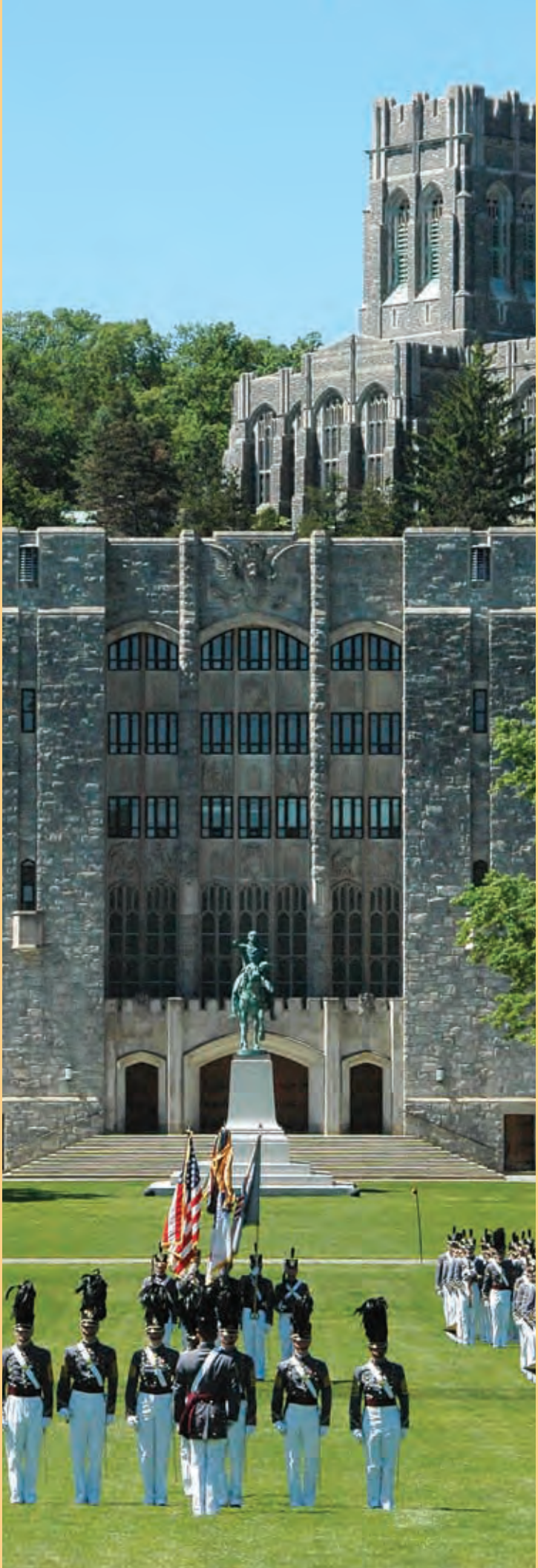
West Point®

The United States Military Academy



Leaders of Promise today become the nation's Leaders of Character tomorrow.

LTG David H. Huntoon, Jr.
Superintendent

The United States Military Academy has been educating training and inspiring leaders of character for our United States Army and for the nation for more than 200 years. West Point is an internationally recognized institution for academic, military, and physical excellence, and we are proud that today's cadets will become tomorrow's military, public, and private-sector leaders. That is our mission at this premier institution of leader development.

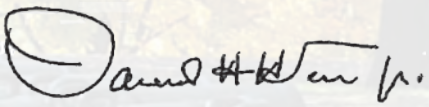
Cadets are challenged — intellectually, militarily, and physically — in an environment that embraces the highest moral-ethical standards. They receive a balanced, first-tier undergraduate education that promotes a lifetime of learning. They complete an excellent military development program that prepares them for a career as a commissioned officer in our Army. And they achieve the highest levels of physical development through a program that emphasizes a lifelong pursuit of personal fitness.

The West Point experience is exciting, challenging, and fulfilling. Our graduates are well-prepared to help lead our Army and our nation.

Take a good look at all that West Point has to offer. Read all you can about the academy and the Army. Consider ROTC and other Army opportunities, and make the decision that is best for you.

If you are inspired to join our Armed Forces and lead in our Army through the 21st century, we look forward to seeing you as a member of The Long Gray Line.

Army Strong!



David H. Huntoon, Jr.

Lieutenant General, U.S. Army
Superintendent

West Point

Mission

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.

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As a young man or woman considering your options for obtaining a quality college education, you may wonder what unique opportunities the United States Military Academy offers. West Point offers one of the most highly respected, quality education programs in the nation.

This fully-funded, four-year federal government program builds a solid leadership foundation that is essential when you serve your country as a U.S. Army officer following graduation.

YOUR MILITARY ACADEMY

CHAPTER 1

The nation's oldest service academy – the world-famous United States Military Academy at West Point – is easily recognized in photographs or television news clips of the Corps of Cadets on parade or of the traditional march-on before the Army-Navy football classic. West Point is much more than a full-dress parade; it is an exciting and memorable four-year experience that stretches your intellect, develops your self-confidence and leadership potential, and prepares you for an important leadership role while serving our nation.

As you consider your college options, ask yourself these questions: What can I expect at West Point? What will West Point expect of me? What makes the academy unique? What follows are the answers to these important questions.

The Academy's Purpose

West Point is charged with educating, training and inspiring young Americans to provide the Army with commissioned leaders of character. The academy prepares graduates for selfless service to the nation.

Service to Country

What does this mean for you? It means that your personal goal should be to serve America as an Army officer. It means that you, as an Army officer, will lead people and organizations; manage resources to maintain the peace or deter or win wars; and accomplish other missions directed by our nation's elected leaders. It means you will operate in demanding and stressful environments where you will need to anticipate the unexpected, reason clearly in the midst of chaos, and lead with bravery and compassion. To help prepare you for the rigors of service as a commissioned officer in the United States Army, West Point provides a stressful, demanding program that will challenge you intellectually, militarily, and physically in an environment that promotes the development of character.

Education — Ranked Among the Best

West Point is consistently ranked among the top colleges in the country, and though it's a great honor, it's not surprising to those familiar with the United States Military Academy.

Since its founding in 1802, West Point has provided a world-class education. It is a Tier I academic institution, placing it in the same category as the famed Ivy League schools. The academic curriculum is broad-based and challenging.

The institution is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, www.msche.org. The Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education. Six engineering majors programs — civil engineering, electrical engineering, mechanical engineering, systems engineering, environmental engineering, and engineering management — are accredited by the Engineering Accreditation Commission of ABET, www.abet.org. In addition, the computer science major is accredited by the Computing Accreditation Commission of ABET, www.abet.org.

Cadets at West Point receive a balanced undergraduate education in the arts and sciences, a Bachelor of Science degree, and a firm foundation for future intellectual growth.

Army Opportunities

When you enter West Point, you are also beginning a profession. Upon graduation you are commissioned as a second lieutenant in the U.S. Army and will serve on active duty for at least five years. As you begin your military career you will be responsible for people, training, and equipment. Each new promotion brings additional responsibility and increased opportunity.

Service within the United States is complemented by overseas assignments, providing cross-cultural awareness and further opportunities for personal and professional growth.

Other Contributions

Clearly, military readiness is the Army's main task. Accordingly, West Point officers have served in capacities as varied as the nation's needs. Because of the breadth of their education and leadership experience, West Point graduates repeatedly have been sought for high-level leadership. Many have continued to serve the nation after a full military career and retirement from the Army. Their numbers include two U.S. presidents: Ulysses S. Grant and Dwight D. Eisenhower. Others are ambassadors, state governors, legislators, judges, cabinet members, educators, engineers, and corporate executives.

History: Change Within Tradition

When you join The Long Gray Line, you become part of a tradition almost as old as the nation. The first of the service academies, West Point has trained officers for more than 200 years. Yet the academy continuously changes in anticipation of the nation's needs. This gradual evolution of the academy's programs and activities has prepared its graduates to serve the nation; however, through it all, West Point remains unwavering in its mission: to provide the Army and the nation with commissioned leaders of character.

Leader Development at West Point

Everything cadets experience during their 47 months at West Point is focused on developing them as leaders of character who will serve as officers in America's Army. There is no other purpose for West Point.

The Cadet Leader Development System is the formal means of coordinating and integrating the programs, activities, and resources necessary to develop cadets as leaders of character. The system provides for sequential and progressive development in three complementary programs – Academic, Military and Physical – in a moral-ethical environment that promotes exemplary character.

Academic

West Point's Academic Program includes an excellent, broadly structured undergraduate curriculum that balances the physical sciences and engineering with the behavioral and social sciences. The goal is for every graduate to be able to think creatively and clearly express original ideas on both technological and interpersonal issues. In addition, the academy seeks to instill in cadets a commitment to progressive and continued educational development.

Military

West Point's Military Program provides an outstanding professional foundation focused on education in the American military ethic and the Army's core values, along with training in individual and small-unit leadership skills. Cadets are inspired to make a commitment to national service as an Army officer and to adopt the ideals of the seven Army Values.

Cadets receive formal military education each year in subjects that prepare them to become leaders. This education is complemented by summer military training, where cadets learn basic Soldier skills, such as firing a rifle accurately, navigating in the woods with a map and compass, and rappelling off high cliffs. In addition, cadets have the opportunity to spend part of one summer assigned to a unit in the field Army. These assignments often take cadets to Europe, Korea, Alaska, or Hawaii. Finally – and perhaps most importantly – cadets are afforded the privilege of leading and training junior members of the Corps of Cadets.

Physical

The Physical Program is focused upon the physically demanding requirements of an Army officer. It endeavors to develop in cadets the ability to maintain personal and unit fitness, fosters the warrior spirit, builds an appreciation for teamwork, and inspires the will to win. Specific program activities include physical education classes, regular fitness testing, and competitive athletics.

Character Development

Moral-ethical development is central to the 47-month West Point Experience and is explicitly mandated by the academy's mission statement. The emphasis on personal character is to support the West Point Motto – "Duty, Honor, Country" – and the ideals of the seven Army Values: loyalty, duty, respect, selfless service, honor, integrity and personal courage. A powerful means of influencing character development is the day-to-day interaction with West Point staff and faculty members, who set high standards for ethical conduct, but West Point also relies upon several formal developmental means.

In the Military Program cadets inevitably experience a wide variety of ethical dilemmas as they perform their duties as leaders and as subordinates. These dilemmas represent opportunities to make decisions that will shape their individual value systems and, potentially, the value systems of their peers. Officer and NCO supervision affords the cadets the opportunity to make ethical choices under the guidance and mentorship of experienced, professional Soldiers. The Simon Center for the Professional Military Ethic at West Point has oversight

on the instruction of Army Values and the professional military ethic as well as the two programs that highlight West Point's core values: honor and respect.

The Honor Program

The ability to educate, train, and inspire outstanding leaders is linked to West Point's commitment to ensuring graduates internalize the values of truthfulness, fairness, respect, and commitment, ensuring others in the Profession of Arms maintain those values as well. In short, West Point expects its graduates and cadets to commit to a lifetime of honorable living. It expects the Corps of Cadets to live by the Honor Code and System, which simply states: "A cadet will not lie, cheat, steal, or tolerate those who do."

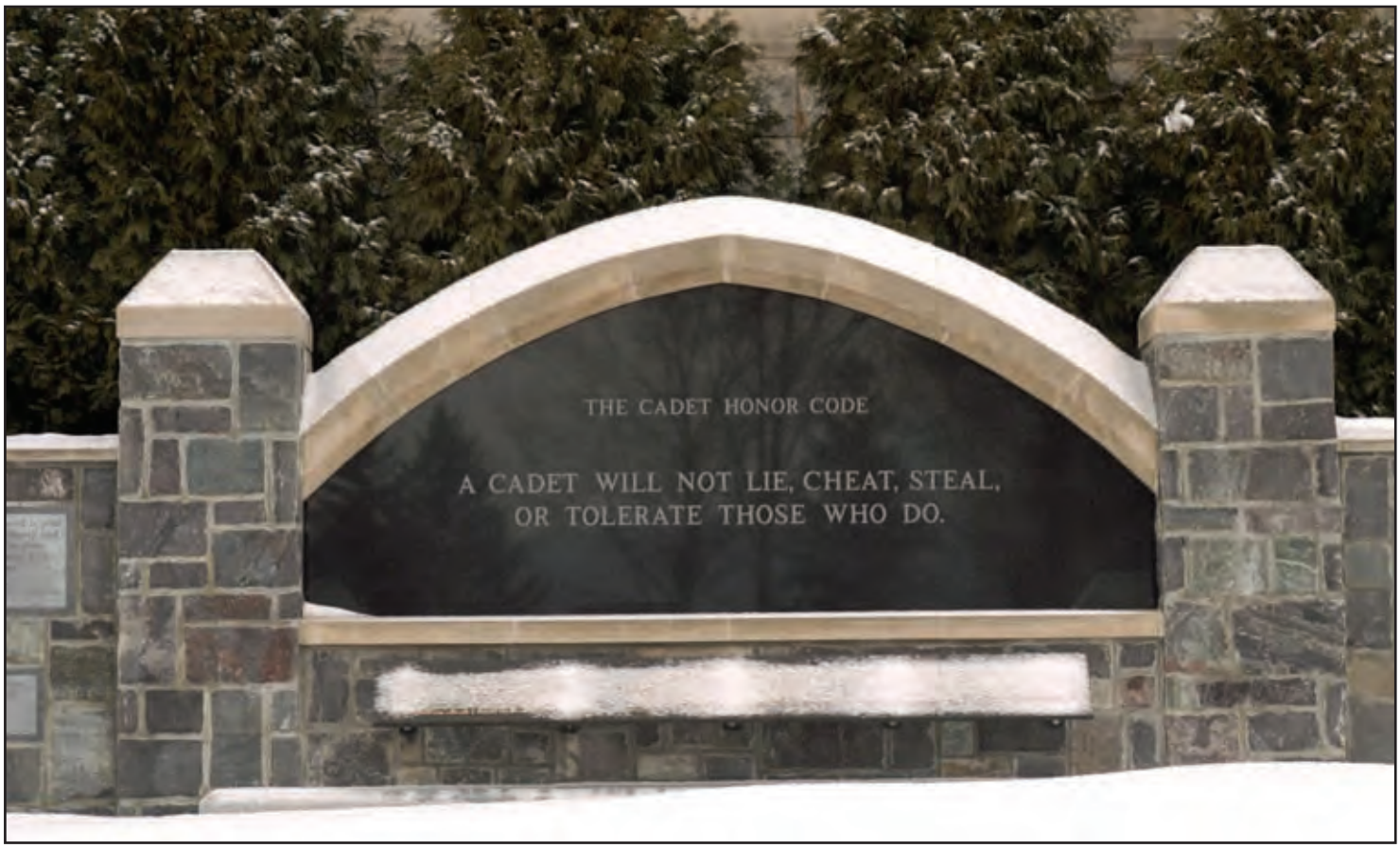
Under the supervision of the staff and faculty, the Corps of Cadets maintains the Honor Code and System. Since 1922, the elected members of the Cadet Honor Committee have represented the corps on all matters pertaining to honor and consider themselves to be stewards of the code.

The Respect Program

The ability to educate, train and inspire leaders of character is linked to West Point's commitment to ensuring a positive command climate, eliminating discrimination, and fostering an atmosphere of dignity and worth. In order to ensure a healthy command climate and focus more succinctly on character development, West Point adopted "respect" as a core value. The intent is to engender an attitude within the Corps of Cadets whereby "Cadets will treat others and themselves with dignity and worth and expect the same from those around them." The Respect Program Goals include many of the same tenets as an Army Equal Opportunity Program and exceed those expectations with its development and execution by a full cadet staff. The Cadet Respect Captain and Respect Committee are responsible for ensuring the corps of cadets understands the leader responsibility for a respectful climate, prevent discrimination, and prepares their fellow cadets for leading a diverse Army operating as ambassadors in diverse nations.

Individual Advanced Development

As cadets progress in their 47-month experience, they may take advantage of voluntary opportunities to pursue a specific area of personal interest through the Individual Advanced Development program. Many of these experiences take cadets to foreign countries, government agencies, or international organizations. Available only to those First and Second Class cadets who have successfully completed their baseline requirements, cadets have their choice of more than 250 enrichment opportunities from all three developmental programs – Academic, Military, and Physical. Most of these activities occur during the summer and provide cadets a unique opportunity for growth in areas of their choice.



Daily Schedule

This schedule typifies a cadet's life during the academic year, August through May. Cadets have many extracurricular opportunities; they may choose from more than 100 extracurricular activities and 25 intercollegiate sports. Worship services and other religious activities are also available for cadets. During the summer months, cadets take vacations and participate in military training and Individual Advanced Development.

The more-than 4,400 cadets who comprise the United States Corps of Cadets form a brigade of four regiments. A cadet regiment consists of three battalions, each with three companies, for a total of 36 companies in the brigade. Cadets fill all officer and noncommissioned officer positions in the corps. Each cadet not only leads but also receives counseling and guidance in the techniques of leadership. In addition, each cadet is rated on leader development through an assessment system.

Typical Daily Schedule

Morning:

6:55	Breakfast Formation
7:05-7:20	Breakfast
7:30-11:55	Class or Study

Afternoon:

12:10-12:25	Lunch Review (Mondays, only)
12:05-12:35	Lunch (Mondays, Lunch until 12:40)
12:50-1:45	Commandant's/Dean's Time
1:55-4:00	Class or Study
4:15-6:30	Intramural/Club Athletics; Drill and Ceremony; Military and Physical Training; or Free Time

Evening:

6:00-7:30	Supper (Optional except Thursday, 6:45-7:15. Plebes have mandatory dinner Mondays & Wednesdays, too.)
7:30-8:30	Evening Study Period/ Extracurricular Activities
8:30-11:30	Evening Study Period
11:30	Taps
12:00-5:20	Lights Out

Vacations and Free Time

The number of vacations (leaves and passes) and the amount of free time a cadet has depends upon seniority as well as performance. While a First Class cadet (senior) has many opportunities to take weekend passes, a plebe (freshman) will have only a few weekend passes available. In addition to these passes, a plebe may leave the academy on authorized athletic, extracurricular, or cultural trips. All cadets may be awarded weekend passes based upon individual or unit achievement. All cadets may take Thanksgiving, winter holiday, spring, and summer leaves.

Pay and Allowances

As members of the U.S. Army, cadAs members of the U.S. Army, cadets receive room, board and more than $10,000 per year in pay. The cadet must pay for a notebook computer, uniforms, textbooks, and activity fees from this amount. Each cadet candidate is asked to make an initial deposit of $2,000 to help defray initial expenses.

Counseling and Health Care

Academic, military, financial and other types of personal counseling are available to cadets at all times. The Center for Personal Development is a cadet counseling service providing individual and group assistance for a variety of personal needs. Apart from this professional counseling, cadets can always seek advice from their peers in the cadet chain of command.

Cadets receive complete medical and dental care while at West Point. If a medical service is not available at the military hospital, civilian medical providers and facilities are used. Costs are reimbursed under the military health plan called "Tricare." Tricare benefits must be preauthorized except for emergency care.

Parents are advised to retain civilian medical coverage for their cadet while attending the academy. Eligibility for military health benefits terminates at midnight on the date a cadet is separated from the academy before completion of the four-year program. Retention of a civilian

medical plan ensures continuous medical coverage of the cadet should there be a discharge. West Point graduates receive medical coverage from the U.S. Army.

Facilities

The academy includes more than 16,000 acres in Orange County, New York, 50 miles north of New York City. Framed by the majestic Hudson Highlands and poised above the Hudson River, the massive gothic structures of the campus blend with the rugged beauty of the surrounding hills.

The West Point Library, located in Jefferson Hall in the academic area, provides up-to-date, fully networked library service to the cadets, faculty and remote users. Supplementing a collection of more than 600,000 volumes, the library offers numerous full-text databases providing access to the contents of thousands of scholarly journals. Open 105 hours per week during the academic year, the library also offers a highly skilled staff, group study rooms, and an extensive microfilm collection. The institutional records of the academy are maintained as part of the library's collections, and these provide invaluable primary source material for cadet and faculty research. Jefferson Hall is a new, state-of-the-art learning center completed in 2008.

West Point's modern academic facilities are matched by its athletic facilities. Michie Stadium, home of Army Football, attracts crowds in excess of 40,000 during picturesque football weekends in the fall. The Kimsey Athletic Center, the Hoffman Press Box, Randall Hall, the Lichtenberg Tennis Center, the Lou Gross Center and the Anderson Rugby Center are new facilities that provide first-class resources for football, basketball, hockey, tennis, lacrosse, gymnastics and rugby programs. The Foley Athletic Center opened its doors in March 2007; it houses a state-of-the-art, climate-controlled indoor playing field.

Holleder Athletic Center, adjacent to the stadium, is a multi-sport complex housing a hockey rink with seating for 2,700 and a basketball arena with a 5,000-seat capacity. The 500,000-square-foot Arvin Cadet Physical Development Center is a state-of-the-art physical fitness facility that includes two gymnasiums, two multi-purpose rooms, two swimming pools, six racquetball courts, five wrestling rooms, a rock-climbing wall, two fitness rooms, and a sports medicine facility.

West of the installation, the reservation's lake-dotted, forested highlands provide an extensive military training and recreational area. In the summer, Camp Buckner is used for field exercises of all descriptions. West Point cadets and residents may also hunt, fish, swim and hike on the reservation. In addition, Army Reserve Component units schedule field exercises; scouts and other civilian groups camp and hike, and local townspeople enjoy the recreational use of Long Pond. Round Pond is a clear mountaintop lake surrounded by a beach, playgrounds, picnic areas, and campgrounds. The Round Pond Office and Bait Shop sells West Point fishing and hunting passes and water ski passes for Stillwell Lake, and the Outdoor Equipment Resource Center, located behind the office, rents camping equipment, boats and trailers, party canopies, and various sports equipment.

West Point has an 18-hole golf course that winds through the lovely hills surrounding the north side of the post, a driving range, and a clubhouse with a pro shop and snack bar that also services the adjoining Victor Constant Ski Slope in the winter months.

Five separate chapels provide a variety of religious services: Christian, Jewish, Muslim, and Buddhist services are available, as are a number of interdenominational prayer groups, clubs, and events.

The Cadet Activities Center, Eisenhower Hall, contains a 4,500-seat auditorium, a 1,000-seat restaurant, a large ballroom overlooking the Hudson River, a games area, an art gallery, and a spacious reception foyer for cadets and guests. Grant Hall offers additional cadet snack and lounge facilities.

The Visitors Center and the West Point Museum provide thousands of visitors a glimpse of daily life at the academy and the history of this military post and its graduates.

By entering West Point, you are taking the first step in a demanding, exciting, and rewarding profession as an officer in the United States Army.

An Army officer takes responsibility for the welfare, development and safety of Soldiers. It is a challenging task. An officer must motivate Soldiers, understand the complexity of sophisticated weapons systems, and analyze various situations and make crucial decisions that may have an international impact.

An Army officer must be able to understand and help fulfill the Army's operational demands of the 21st century. Army divisions are reorganizing to become leaner and more mobile, yet more lethal in their ability to defend our nation. Officers must be able to adapt to new technologies, especially digital communications, which speed the exchange of information among all operational levels. These new technologies enable commanders to move their forces faster and concentrate their firepower more effectively.

An Army officer's leadership skills will be challenged with the various roles the Armed Forces play throughout the world. There is disaster assistance, community support, large and small missions, joint and allied training, and peacekeeping around the world.

An officer is a role model for Soldiers, instilling the strengths of the U.S. Army's core values – loyalty, duty, respect, selfless service, honor, integrity and personal courage – while leading and guiding his or her troops. Most importantly, there is a sense of pride that comes with being part of the world's finest Army.

After Graduation – What Then?

Upon graduation, you will be commissioned a second lieutenant in the U.S. Army and serve for at least five years on active duty as an Army officer.

When a West Point graduate flings his or her cap in the air, signaling the end of a 47-month experience on the banks of the Hudson River, it also signals the start of a special career where self-sacrifice and self-discipline are required.

The Army has a wide variety of specialized fields, called "branches." Each branch requires its own brand of technical and tactical expertise. Depending upon the needs of the Army and your personal desires, you will select from such branches as Adjutant General Corps, Air Defense Artillery, Armor, Aviation, Chemical Corps, Corps of Engineers, Field Artillery, Finance Corps, Infantry, Military Intelligence, Military Police, Ordnance, Quartermaster, Transportation Corps, Medical Service Corps, or Signal Corps.

Whatever the branch, an officer is responsible for the training and morale of his or her troops and the maintenance and employment of their equipment. Assignments around the world test an officer's leadership and managerial skills. The officer's performance and the needs of the Army are considered when determining the nature and locale of assignments.

Officers attend a Basic Officer Leader Course that teaches junior officers about the Army culture and trains them in basic field skills. Upon successful completion of this course, officers transition to branch-specific courses to develop their competence in the technical aspects of their specialties.

During the first eight years of service, officers will be in first-line leadership, troop command, and staff positions and gain additional education and training, both military and civilian. All officers attend an advanced course in their branch area of specialty to prepare for the higher levels of responsibility, leadership, and specialization required as commanders.

Advanced Professional Development

At about the 11th year of service, every officer selects a career field. This critical point in an officer's career provides the opportunity to stay as a mainstream warfighter or shift to a functional specialty, such as operations research, foreign area officer, communications-electronics, or engineering. Professional patterns in the modern Army have come to demand academic specialization. Many academy graduates who remain in the Army earn graduate degrees from leading civilian universities.

Officers continue on to Command and General Staff College, where they study subjects such as high-level management practices and international affairs. Education and experience at this level prepare them for the highly rewarding later years when they may be working in the Pentagon, commanding a large troop unit, serving as a military attach in a foreign country, or having the responsibility of being in charge of leading a professional school, training junior officers.

Outstanding officers are selected to attend one of the Senior Service Colleges or a foreign equivalent. Many make creative contributions to thought and research on the defense implications of their specialties.

A small group of the most talented officers is selected for the rank of general officer. They make their greatest professional contributions commanding divisions or larger units composed of thousands of men and women, or participating in the highest policy councils of the nation.

It is a great responsibility to lead Soldiers in a time of national emergency and to guard the nation's readiness in times of peace. Life as an Army officer is driven by service to country and is full of challenge and satisfaction.

Each year West Point admits approximately 1,200 young men and women. These new members of the Corps of Cadets come from all corners of the United States and represent nearly every race, religion, and culture in the country. Nurtured by the West Point environment, this diversity of background helps cadets gain a culturally rich educational experience.

Steps to West Point:

1. Determine whether you meet the basic requirements.
2. Start a file at West Point online (http://admissions.westpoint.edu/).
3. Apply for nominations.
4. Fill out West Point forms online.
5. Follow up on the nomination process.
6. Complete testing, including:
   - ACT (including the writing section) and/or SAT
   - Qualifying Medical Exam
   - Candidate Fitness Assessment.
7. Monitor the evaluation and status of your application.
8. Visit West Point on a Candidate Orientation Visit.
9. Prepare for entrance to West Point.

ADMISSIONS

CHAPTER 3

To become a cadet you must meet the requirements specified by public law and must be qualified academically, physically and medically. Each candidate must also obtain a nomination from a member of Congress or from the Department of Army in one of the service-connected categories described later in this section. As a candidate, you are evaluated for admission on the basis of academic performance (high school record and SAT or ACT scores, including the required writing portion, if taking the ACT), demonstrated leadership potential, fitness assessment, and medical qualification.

West Point seeks a class composition of top scholars, leaders, athletes, Soldiers, women, and minorities to maintain a diversified collegiate environment and corps. The academy encourages a strong college-preparatory academic background as a prerequisite for admission. Recommended areas of preparation are: four years of English, with strong emphasis on composition, grammar, literature, and speech; four years of math – algebra, plane geometry, intermediate algebra, trigonometry; at least two years of a foreign language; four years of science, including two years of laboratory science such as chemistry and physics; and one year of U.S. history.

Additionally, you will find courses in geography, government, and economics to be very helpful. If your school includes a course in pre-calculus and calculus in its curriculum, and a basic computer course, those courses will be extremely helpful during your first year at West Point. College courses taken prior to entrance to West Point may be substituted for similar courses in the academy curriculum (see "Validation" in Chapter 4).

1. Determine whether you meet the basic requirements.

General Qualifications

Candidates must:

– Be at least 17 but not older than 23 on July 1 of the year they enter West Point.

– Not be married.

– Not be pregnant.

– Not be legally responsible for support of any children.

Medical Qualifications

Candidates must:

– Be in good physical and mental health.

– Pass a Medical Exam (see Appendix B).

Physical Qualifications

Each candidate should have:

– Above-average strength, endurance and agility.

– Strong performance on West Point Candidate Fitness Assessment (see Appendix C).

2. Start a file at West Point online.

West Point will start your candidate file upon receipt of a completed Candidate Questionnaire. You should complete the Candidate Questionnaire online at the Admissions website, **http://admissions.westpoint.edu**, in the middle of your junior year in high school or as soon thereafter as possible. You must have a Social Security number to establish a file. Your file will be reviewed, and you will be notified if you lack the qualifications to compete for admission.

3. Apply for a nomination.

You must obtain a nomination in order to compete for admission to West Point, and you should apply for a nomination from each source for which you are eligible during the spring of your junior year.

Congressional nominating authorities specify to the Department of Army the method of selecting candidates to fill cadetships. Cadetships are allocated by law to the vice president; members of Congress; congressional delegates from Washington, D.C., the Virgin Islands, and Guam; the governors of Puerto Rico and American Samoa; the resident representative to the United States from the Commonwealth of the Northern Mariana Islands; and the Department of Army.

At a minimum, most candidates are eligible for a congressional nomination from their local congressional representative, their two United States senators, and the vice president of the United States.

You can find information about applying for nominations and view request letter formats on the West Point Admissions webpages: www.westpoint.edu/admissions.

Types of Nominations

Congressional

U.S. senators and representatives nominate from their respective states and districts. Members of Congress may select up to 10 young people to compete for each cadetship vacancy they have. As a member of Congress, the vice president has five cadetships for applicants from the United States at large. U.S. senators and representatives nominate from their respective states and districts. Members of Congress may select up to 10 young people to compete for each cadetship vacancy they have. As a member of Congress, the vice president has five cadetships for applicants from the United States at large. Candidates interested in seeking a vice-presidential nomination should apply online at the following website: www.whitehouse.gov/administration/vice-president-biden/academy-nominations. Applicants must complete the online nomination application during the application period of March 1 to January 31 preceding the year of entrance to the academy.

The Washington, D.C., congressional delegate nominates from that district. The governor of Puerto Rico nominates a native-born Puerto Rican, and the Puerto Rican Commissioner nominates five residents of Puerto Rico. Congressional delegates of Guam and the Virgin Islands, the resident representative from the Northern Mariana Islands, and the governor of American Samoa nominate sons and daughters of U.S. citizens or nationals living on their respective islands.

Service-Connected

Sons and daughters of career military personnel are eligible for presidential nominations. The term "career military personnel" refers to members of the Armed Forces (Army, Navy, Air Force, Marines, Coast Guard) who are on active duty other than for training and who have served continuously on active duty for at least eight years, or who were retired with pay or granted retired or retainer pay. Also included are service members currently serving in the Reserve Component who are credited with at least eight continuous years of service computed under section 12733 of Title 10, United States Code. Finally, **members of the Select Reserve** who would be (or who died while they would have been) entitled to retirement pay except for not having attained 60 years of age are also included in this category.

Regular Army and Reserve Components

This category is for enlisted members of the Regular Army, Army Reserves, and Army National Guard. To request a nomination under this category, enlisted members should submit a commander's endorsement with their applications.

This application must reach the Director of Admissions by the second Monday in January. Soldiers who are not offered an appointment to West Point are automatically considered for enrollment in the U.S. Military Academy Preparatory School (USMAPS). Some applicants who fail to obtain admission to West Point on their first tries enlist in the Army and win appointments in either the Regular Army or Reserves category on their second attempts. If interested, consult with an Army, Army Reserve, or Army National Guard recruiter.

Honor Military, Naval Schools, and ROTC

Applicants enrolled in a junior or senior Army Reserve Officer Training Corps program are eligible for nomination in this category. Certain ROTC schools designated by departments of the Navy, Air Force, and Marine Corps as "Honor Units with Distinction" may recommend three of their honor graduates for nominations. Applications should be made through the professor of military science or the senior instructor at such a school to the Director of Admissions, U.S. Military Academy, 606 Thayer Road, West Point, NY 10996-1797.

Your senior instructor must fill out and submit a Request for ROTC Nomination to USMA (Form 5-497) and a USMA Admissions Interview Report (USMA Form 21-8) to be considered for a nomination. This application must reach West Point by the second Monday in January. The best-qualified candidates, without regard to schools, are then selected for enrollment.

Sons and Daughters of Deceased or Disabled Veterans

This category is for sons and daughters of deceased or 100-percent disabled Armed Forces veterans whose deaths or disabilities were determined to be service-connected, and for sons and daughters of military personnel or federally employed civilians who are in a missing or captured status. Application should be made to the Director of Admissions, U.S. Military Academy, 606 Thayer Road, West Point, NY 10996-1797. This application must reach West Point by the second Monday in January.

"The more you sweat in peace, the less you bleed in war."

Chinese proverb

"No man who is occupied in doing a very difficult thing, and doing it well, ever loses self-respect."

George Bernard Shaw

Sons and Daughters of Persons Awarded the Medal of Honor

All sons and daughters of persons awarded the Medal of Honor who seek admission and are fully qualified will be admitted. Apply by the second Monday in January to the Director of Admissions, U.S. Military Academy, 606 Thayer Road, West Point, NY 10996-1797.

Other Countries

No more than 60 citizens of foreign nations may be West Point cadets at one time. The applicant should prepare a letter requesting a nomination, addressed to the United States defense attach of the nominating nation. Requirements for enrollment, advancement from class to class, and graduation are the same as for United States citizens.

The three nomination methods are:

Competitive Nominations

The nominating authority submits a slate of up to 10 nominees. West Point evaluates all nominees and ranks them according to their qualifications. The best-qualified nominated candidate is selected for an offer of admission.

Principal with Competing Alternates

The nominating authority designates a principal nominee; up to nine alternates compete as above for the cadetship only if the principal nominee is disqualified.

Principal with Numbered Alternates

If the selected principal nominee is not fully qualified, each alternate is evaluated in the order designated by the nominating authority until one is found fully qualified.

Department of the Army Nominations

Service-Connected (Presidential).....100

Enlisted Members of the Regular Army 85

Enlisted Members of the Army Reserve/ National Guard 85

Honor Military, Naval Schools and ROTC 20

Sons and Daughters of Deceased or 100-percent Disabled Veterans (approx.) 20

Sons and Daughters of Persons Awarded the Medal of Honor..... Unlimited

4. Fill out West Point forms online.

The Admissions Office reviews Candidate Questionnaires, and candidates who pass the initial screening will receive instructions about the remaining admissions requirements, including being qualified by the Department of Defense Medical Examination Review Board (DoDMERB). All procedures and forms must be completed promptly. Candidates who do not pass the initial screening will be notified.

5. Follow up on nominations.

Each year, more than 10,000 candidates open files for admission to West Point. Only about 4,000 receive congressional or service-connected nominations. A nomination is the legal authority for West Point to offer admission, and the nomination process is independent of the West Point admissions evaluation. It is important that you aggressively pursue every nomination available to you.

6. Complete testing, ACT and/or SAT.

All candidates must take the timed ACT or SAT. West Point does not accept un-timed scores for academic evaluation. We recommend that candidates take both the SAT and ACT at least once.

Please note: All candidates for admission are required to submit a writing score with their SAT and/or ACT exam. The SAT has a writing exam as part of the basic test;

however, the writing portion on the ACT is currently optional. If you register for the ACT, you must select the "ACT Plus Writing" exam in order to be considered for admission. **ACT scores submitted without the writing section will not be evaluated.**

It is recommended that candidates take the ACT and/or SAT exams as many times as practical, as the Admissions Committee only considers the candidate's highest scores on each segment of the exams.

Although not required for admission, advanced placement examinations are considered in several subject areas, including mathematics, physics, chemistry, history, and social sciences (see Page 32 on Validation and Advanced Placement). Results are evaluated for awarding formal credit for course completion or scheduling individuals into higher-level sections or classes.

ACT

The ACT is administered at test centers throughout the world. For information on ACT testing in your locale, consult any high school counselor or visit the ACT website: **www.act.org**. Again, if you register for the ACT, you must select the "ACT Plus Writing" exam. To ensure West Point receives your test results, list the ACT college code number for USMA (2976) on your registration folder. To ensure your congressional representatives receive your test results, you must place their ACT code number on your application. The congressional code numbers are listed in your test registration booklet or can be obtained on the ACT website at **www.act.org**.

SAT

Candidates taking the College Board exam for admissions are required to take the SAT I. (Note: SAT II subject tests are not required.) To take the examination, consult your guidance counselor or visit the "Student" section of the website: **www.collegeboard.com**. To ensure West Point receives your test results, list the college code number for West Point (2924) on the registration form. To ensure your congressional representatives receive your test results, contact your congressional representatives to obtain their College Board code numbers and record each number on the registration form. Your test results will be mailed directly to your congressional representatives. Final admissions decisions will be made by April from the data then present in the candidate's file.

Qualifying Medical Exam

All candidates desiring to enroll must take a Qualifying Medical Examination. One Qualifying Medical Examination meets the application requirements of all service academies and all ROTC scholarship programs. The Department of Defense Medical Examination Review Board (DoDMERB) will schedule your exam and evaluate the results after you have started an admissions file. You will receive instructions for taking the Qualifying Medical Examination directly from DoDMERB. It is important to schedule medical exams at the earliest time possible to allow sufficient time to resolve potential medical issues.

For information or questions on medical issues, applicants may visit the following DoDMERB website: **https://dodmerb.tricare.osd.mil**. To access information about DoDMERB, click on the "FAQs" link on the left column menu. For tracking medical status, applicants should click on the "Applicant" link. Detailed West Point medical requirements are covered in Appendix B.

Candidate Fitness Assessment

In order to qualify for admission to West Point, all candidates must pass the Candidate Fitness Assessment (CFA). The CFA measures strength, endurance, and agility. There are six events in this test: basketball throw for distance from kneeling position, pull-ups, timed shuttle run, modified sit-ups, pushups, and timed one-mile run. Those six events are described in more detail in Appendix C. Candidates

will receive instruction booklets for their physical education instructors describing how to conduct this test in their schools. In addition, any Army officer or West Point liaison representative may administer the CFA.

Candidates are advised to prepare for this examination by engaging in vigorous activities such as running, general conditioning exercises, and competitive games, in addition to practicing the specific test events. The only other CFAs accepted by West Point are the Naval Academy or the Air Force Academy CFAs. It is the candidate's responsibility to have the results of one of these exams sent to the Director of Admissions.

7. Monitor Application Status.

A formal offer of admission is possible as early as November for fully qualified, outstanding candidates who have completed all admissions requirements and receive nominations. Admissions decisions are made on a rolling basis, with the majority of offers of admission announced by mid-April. Files not completed by the last working day in **February 2012** will be closed to further consideration. It is possible that a few candidates will not be notified of acceptance until shortly before entrance in June. Offers of admission are conditional from the time of offer to date of admission.

8. Visit West Point.

Candidate Orientation Visits are offered Monday through Friday during the academic year (September to November and January through April). Members of the Corps of Cadets volunteer to escort each candidate individually, and the orientation includes class attendance, a visit to the barracks, lunch in the Cadet Mess and an Admissions briefing. If you have the opportunity, a visit to West Point offers invaluable insight into cadet life and can greatly assist in the college decision-making process. A student who has applied for admission can arrange for a **visit at our website – http://admissions.westpoint.edu/. Please understand that at least two weeks' notice is required to schedule a visit**. For more information about orientation visits, please call (845) 938-5760.

9. Prepare for entrance to West Point.

Candidates should prepare for the academic, physical, and leadership demands a cadet faces at West Point. If you have met the academic qualifications for admission, you will be ready for the challenges of the West Point curriculum. Work hard on your physical fitness conditioning before entering the academy. Vigorous conditioning exercises, swimming, and cross-country running are recommended. It is especially important that a candidate train through a variety of strenuous activities. Participation in school and community activities helps a future cadet prepare for leadership positions at West Point, and seeking leadership roles in those activities or on sports teams can further enhance leadership preparation.

West Point Liaison Officers

West Point Admissions enjoys the nationwide assistance of liaison officers who provide service to candidates. They include graduates of West Point, both in and out of the active Army, and U.S. Army Reserve officers who have been trained at West Point for this specific program. These volunteers are available to assist candidates in the admissions process and to answer questions about specific West Point programs. Through them, the Admissions Office can maintain a flow of information about the West Point Experience and assist candidates in pursuit of appointments to the academy.

To locate a liaison officer or Admissions representative in your area, you first must find your congressional district. Visit the website www.house.gov and type in your zip code at the top of that page to locate your congressional representative. Then call your region's candidate technician and ask for your region's candidate technician, who can identify your local Admissions representative from your congressional district number. You can find the staff for your region – Northeast, Southeast, Great Lakes, Southwest, or Far West – on the Admissions website at http://admissions.usma.edu/staff.html.


FOR THOSE WE LEAD
2015

PROFILE: CLASS OF 2015

Volume of Applicants

	Men	Women	Total
Applicant Files Started	11,198	2,756	13,954
Nominated	3,627	717	4,344
Qualified (academically & in physical aptitude)	2,141	399	2,540
Admitted	1,049	212	1,261

Rank in High School Class

First Fifth	71%
Second Fifth	20%
Third Fifth	8%
Fourth Fifth	1%
Bottom Fifth	0%

American College Testing (ACT) Assessment Program Scores**

Range	Eng	Math	Sci Reas	Read
31-36	41%	40%	26%	50%
26-30	40%	43%	48%	34%
21-25	17%	17%	25%	15%
16-20	2%	0%	1%	1%
11-15	0%	0%	0%	0%
Mean	29	29	28	30

College Board Scholastic Assessment Test (SAT) Scores**

Range	Critical Reading	Math
700-800	20%	26%
600-699	46%	49%
500-599	29%	23%
400-499	5%	2%
300-399	0%	0%
Mean	627	646

***Includes only scores used as a basis for admission.*

Academic Honors

Class Valedictorians	97
Class Salutatorians	42
National Merit Scholarship Recognition	227
National Honor Society	747

Activities

Boys/Girls State Delegate	214
Class President or Student Body President	232
School Publication Staff	
School Paper Editor, Co-Editor or Staff	141
Yearbook Editor or Co-Editor	96
Debating	162
Dramatics	106
Scouting Participants	445
Eagle Scout (men) or Gold Award (women)	160
Varsity Athletics	1,155
Letter Winner	1,093
Team Captain	777
Combat Veterans	17
International	14

Geographical Distribution

The Class of 2015 entered West Point with 1,261 new cadets, including 1,247 United States citizens and 14 international cadets. Cadets were appointed by Congress from each of the 50 United States, as well as from military- service sources. Seventeen combat veterans entered West Point with the Class of 2015.

The international cadets are from the countries of Chad, Colombia, Georgia, Honduras, Jordan, Kazakhstan, Latvia, Lithuania, Maldives, Romania, Rwanda, Serbia, Tunisia, and Taiwan. Upon graduation, those cadets will return to their countries as officers in their respective armed forces.

Young people entering West Point can expect to expand their knowledge, to develop more fully the intellectual skills they need to assume responsibilities as junior officers, and to build strong foundations for assuming senior officer responsibilities. They will also acquire a firm foundation for postgraduate specialization in one of a variety of academic disciplines.

ACADEMIC PROGRAM

CHAPTER 3

Brigadier General Timothy Trainor
Dean of the Academic Board

The Educational Philosophy

West Point, as the only college specifically charged with preparing young men and women for service as officers in the United States Army, has a singular educational philosophy: Graduates must be enlightened military leaders of strong moral courage, whose minds are creative, critical, and resourceful.

Standard academic courses provide an essential core of knowledge in the arts and sciences with emphasis on problem-solving. Advanced and elective courses allow the individual cadet to concentrate or major in a specific area of interest.

The Academic Program, Physical Program, and Military Program form the three major aspects of the West Point leader-development experience. While the academy continually adapts itself to the pace of professional, national, and international change, it remains true to the sense of duty, honor, and service to country that has traditionally distinguished its graduates.

The Academic Curriculum

The present curriculum, described in detail later in this chapter, reflects more than 200 years of evolutionary change, both in the military profession and in higher education. Today's balanced offering of courses in the arts and sciences leads to a Bachelor of Science degree and builds a foundation for continuing education and professional development.

Methods of Instruction

A cadet is far more than a mere face in the crowd. Small classes – usually 12 to 18 cadets – assure individual participation and individual attention.

Cadets are encouraged to participate daily and are evaluated frequently. If a cadet is unsure of the material taught on any given day or wishes to move beyond it, extra one-on-one instruction is available.

Cadet Support – Center for Enhanced Performance

One of the unique features of West Point is the Center for Enhanced Performance (CEP), an unparalleled facility devoted to educating and training the key mental and academic skills that underlie high performance in all situations. At the CEP, cadets have the opportunity to participate in two different programs oriented toward maximizing performance in West Point's academic, physical, and military experiences. Additionally, cadets can take integrative courses designed to incorporate fundamental skills from both programs in order to more fully develop as self-regulated learners:

RS101 Student Success Course helps cadets enhance their overall cadet performance through education in time management, organization, note taking, test taking, reading efficiency, confidence, concentration and goal setting. Course lessons integrate academic and human performance strategies for a more holistic approach to student development. This 20-lesson course is worth .5 credit.

RS100 is a specifically tailored course for cadets who previously attended the United States Military Academy Preparatory School (USMAPS). This course is 10 lessons long and focuses on enhancing skills previously learned at USMAPS and applying these skills in their current West Point courses. This course is worth .5 credit.

Within the CEP, the **Academic Excellence Program (AEP)** provides cadets with a variety of individual and collective services focused on developing and then achieving their academic goals. The AEP also provides cadets with opportunities to interact in informal collaborative learning environments with peers, faculty, and staff. Academic courses offered by the AEP include:

RS101-in-MA100 MA100 is specifically tailored to incorporate RS101 study skills into MA100, the pre-calculus course for cadets entering the academy underprepared in math. This 17-lesson, .5-credit course is based on the standard RS101 curriculum but focuses mainly on skills necessary for math.

RS102 Reading Efficiency is a 10-lesson, no-credit course that has no homework. Students historically double or triple their reading speeds and read more strategically without losing comprehension.

RS103 Information Literacy and Critical Thinking is co-taught with the library staff. It focuses on helping cadets become better consumers of information, better problem-solvers, and better at thinking critically about how they construct and deconstruct arguments. This is a 20-lesson course worth .5 credit.

In addition to these courses, the AEP provides all West Point cadets with a variety of individualized and group student development services.

The AEP's **Company Tutor Program** is one of the nation's most comprehensive peer tutor programs, with over 700 cadet tutors. It is certified by the College Reading and Learning Association (CRLA). The tutor director mentors the cadet academic staff and coordinates and facilitates annual tutor training and Term End Examination (TEE) preparation sessions for all cadets.

Another valuable resource within the AEP is the **Academic Athletic Support Coordinator Program**. These counselors are hired by the Director of Intercollegiate Athletics but partner with the CEP to work specifically with student athletes, providing individualized support, writing assistance, and group sessions that help cadets achieve academic success.

ACADEMIC PROGRAM GOALS

The overarching goal of the Academic Program at West Point is "to enable its graduates to anticipate and to respond effectively to the uncertainties of a changing technological, social, political, and economic world." From this goal, the academy derives a set of 10 specific program goals that address specific Army needs and reflect the attributes the academy seeks to develop in every graduate. The achievement and integration of all 10 Academic Program Goals enable graduates to meet the overarching goal.

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

Upon achieving this overarching goal, graduates will be able to:

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

and demonstrate proficiency in six domains of knowledge:

- Engineering and Technology
- Math and Science
- Information Technology
- History
- Culture
- Human Behavior

Another CEP program is the **Performance Enhancement Program (PEP)**, which provides individual and team instruction in applied sport psychology, using state-of-the-art training methods and sophisticated audio/video technologies. This training, as comprehensive and detailed as any received by professional and Olympic athletes, enables cadets to develop confidence under pressure, concentration amidst distractions, and composure during times of stress. It is designed to enhance the adaptive thinking, mental agility, and self-regulation skills essential to the pursuit of personal strength, professional excellence, and the Warrior Ethos.

While derived from sport psychology, this training benefits all aspects of cadet performance and is available to all cadets. Cadets participate in individual training sessions during free periods in their academic schedule, learning and then applying the skills of visualization, attention control, energy management, and goal setting. Biofeedback training allows cadets to learn crucial self-regulation techniques, and sophisticated audio and video simulations of game and practice situations are created to facilitate guided imagery and mental rehearsal of specific sport skills.

The center's own audio/video studio produces custom-made audio files from cadets' goal scripts and instructional/motivational videos from game or practice footage. State-of-the-art electronic visual-skills training devices allow cadets to improve peripheral awareness, visual concentration, and reaction speed. In addition to individual and collective mental skills instruction, the PEP also teaches:

PL360 Psychology of Elite Performance is a full-semester course in the theory and application of psychological skills related to physical, academic, and military performance. Cadets engage in detailed monitoring of cognition and affect, and complete projects in stress management, goal setting, imagery, and applied research. This is a 40-lesson course carrying 3.0 credits.

CEP training has been widely used both at West Point and throughout the Army to enhance the mental skills necessary to thrive amid the pressure and stress of a dynamic and complex combat environment. The Center for Enhanced Performance is a powerful demonstration of the academy's commitment to provide the finest training available to the future leaders of the nation.

Academic Support — West Point Library

The West Point Library serves cadets for both academic research and recreational reading. The library's resources include more than 600,000 volumes, more than 58,000 journals in paper and electronic format, newspapers, government documents, audiovisual materials, official West Point archives, microform journal files, and valuable special collections. Knowledgeable staff members are on hand seven days a week to provide individual and group assistance.

The library is located in Thomas Jefferson Hall, the academy's new learning center that opened in the fall of 2008. Sharing the facility with the Center for Enhanced Performance and the Center for Teaching Excellence, Jefferson Hall provides students with an inviting location for personal intellectual development. The combined learning center staff offers cadets and faculty the highest caliber of support in their pursuit of academic endeavors.

Working in a wireless laptop environment, cadets have access to the online catalog and a broad array of undergraduate and graduate-level online research material and services. Cadets have the opportunity to work with a vast array of manuscript collections and rare books in the library's special collections and archives. Many of these resources have been transformed to digital format and are available on the library's webpage.

Present library resources are comparable to those of a quality liberal arts college, but also reflect considerable strength in the fields of history, mathematics, science, and engineering. Extensive holdings in military subjects attract national and international scholars for special research work at West Point.

Special collections include the papers and books of famous West Point graduates including those of General Omar Bradley and General George Patton. The official cadet and academic records of the academy also provide a rich resource for study and research on West Point topics.

While the library continues to expand its resources through the newest technology and information resources, its history actually predates that of the academy. The book collection that formed the first library represents the first federal library in the United States. These early acquisitions were made by Colonel Sylvanus Thayer in Europe during the two years before he became superintendent in 1817. With the support of then-Secretary of War James Monroe, Colonel Thayer purchased about 1,000 books, which formed the foundation of early engineering education in the nation.

Information Technology Learning Environment

West Point is committed to the idea of operating an "information rich" environment wherever learning occurs. Cadets and faculty at West Point enjoy the benefits of a first-class information technology environment. Every cadet has a notebook computer, and everyone is connected – wired and wirelessly – to a large array of powerful academic computing services at West Point, with access to the Internet.

West Point has carefully crafted an electronic environment in which virtually every course offered has integrated computer use. This developmental "computer thread" fosters cadet use of their computers in the place where most learning occurs: in the barracks. Computer-aided design and simulation, dynamic news sources, email, spreadsheets, statistical analyses, database access, library bibliographic research and electronic bulletin boards are available to cadets.

Duke Basketball Coach Mike Krzyzewski, USMA '69, signs his latest book at the Cadet Book Store.

Document preparation, printing and other resources all contribute to an academic environment rich with information resources and electronic media tools. Cadets also register for classes, get grades and counseling reports, and receive and send homework assignments using the West Point network. Through the use of virtual private network (VPN) services, the network is extended to include wherever cadets or faculty members are, enabling access to West Point enterprise resources from any location with internet access.

With more than 6,000 active users, the West Point network has been ahead of most educational institutions since its initial installation in 1989. On the average, approximately 8.5 million email messages transit the network monthly, with thousands of academic, sports, and internal webpages; information from virtually every aspect of the West Point Experience is instantly available at every user's fingertips. The networking infrastructure continues to evolve to meet the needs of the cadets. West Point now has 100 percent secure wireless coverage in every academic building and most common areas, and is expanding to include additional capability in the cadet living areas and outdoor locations.

In the classroom, modern and powerful workstations and excellent projection devices connected to network services enable cadets and faculty to use sophisticated software, such as computer-aided design, modeling and simulation, 3-D terrain visualization, and foreign-language instruction, in support of classroom interaction. Computer laboratories feature the same user interface as cadets use in their rooms, and multimedia – digital sound and video, interactive instruction, streaming media, etc. – is used across the curriculum. In 2011, West Point is piloting the use of iPads in support of the academic and training mission.

Graduates of West Point are well-versed in the use of information technology and services and are ready for the challenges awaiting them in the high-tech Army of the present and future.

Questions on information technology may be directed to ietdassist@usma.edu.

Lecture Series

Academic departments and other groups sponsor a comprehensive lecture series that complements the academy's course of instruction. Guest lecturers include recognized authorities in various academic disciplines, noted authors, playwrights, religious and civic leaders, businessmen, and military leaders.

Among lecturers have been Coach Mike Krzyzewski (USMA '69); American entrepreneur T. Boone Pickens; President George W. Bush; broadcaster Tom Brokaw; former U.S. Treasury Secretary William E. Simon; Reverend Desmond Tutu, archbishop of Cape Town, South Africa; former U.N. Secretary General Boutros Boutros-Ghali; Madeleine K. Albright, former U.S. ambassador to the U.N. and former secretary of state; former New York City mayors Rudy Giuliani and Ed Koch; and former Philippines President Fidel Ramos (USMA '50)..

Other notables who have lectured at the academy include H. Ross Perot, founder of EDS Corporation and former presidential candidate; Frank Borman, former astronaut and CEO of Eastern Airlines; Sandra Day O'Connor, former associate justice of the U.S. Supreme Court; and the Reverend Jesse L. Jackson, founder of the National Rainbow Coalition.

Graduate Civil Schooling

The growing complexity of technology, international diplomacy, and world commitments of the Army has increasingly come to demand that Army officers attend civilian graduate institutions. Many academy graduates who serve on active duty more than the required five years attend graduate school through the Army Civil Schooling Program or on a scholarship or fellowship.

Army Civil Schooling Program

Qualified graduates are normally selected for fully funded master's programs at civilian graduate schools between their fourth and 10th years of active military service.

Medical and Legal Training

Up to two percent of each West Point graduating class may attend medical school immediately following graduation. The exact number each year will vary depending upon the needs of the service, the qualifications of the applicants, and their acceptance into medical schools. There are two fully funded sources that produce physicians for the Army: the Uniformed Services University of the Health Sciences and the U.S. Army Health Professions Scholarship Program. West Point graduates may participate in either program. If not selected to attend immediately following graduation, they may compete with other active duty Army officers after they are commissioned. Under the provisions of the Judge Advocate General Funded Legal Education Program, selected officers may attend law school. West Point graduates must complete two years of active duty to become eligible for consideration. Selection

for law school is competitive among all active duty officers who apply.

Phi Kappa Phi

The West Point chapter of the National Honor Society of Phi Kappa Phi was established in 1978. Membership in the society is based upon demonstrated academic ability and good character. Any cadet may be elected to membership who is a Second Class cadet (junior) and ranks, by Academic Order of Merit, in the upper 7.5 percent of the class or is a First Class cadet (senior) and ranks in the upper 10 percent of the class.

Fellowships and Scholarships

West Point is fourth on the list of total winners for Rhodes Scholarships, fourth on the list of Hertz Fellows, and seventh for Marshall Scholarships. In each case, the institutions with more scholarship winners also have larger student bodies.

Rhodes Scholarships

Ninety academy graduates since 1923 have been awarded Rhodes Scholarships to attend Oxford University while on active duty, making West Point the nation's fourth-ranking source of Rhodes Scholars. Three cadets in the Class of 2010 were selected as Rhodes finalists, and Cadets Elizabeth Betterbed and Alexandra Rosenberg won the Rhodes Scholarship in November 2009. Selection is based on four categories specified in Cecil Rhodes' will: (1) intellectual excellence and attainment, (2) strength of character, (3) demonstrated leadership ability, and (4) the demonstration of physical vigor. Rhodes hoped that scholars would "esteem the performance of public duties as their highest aim."

Marshall Scholarships

The Marshall Scholarship program was established in 1953 by the government of the United Kingdom in honor of General George C. Marshall and in gratitude for the Marshall Plan. The program annually awards scholarships to graduates of United States colleges and universities for two years of study of any subject leading to the award of a British university degree. Cadet Jeremy D. Smith was selected as a Marshall Scholar in November 2010. The selection committee looks for distinction of intellect and character, as evidenced by scholastic performance and other achievements. West Point first participated in the Marshall Scholarship competition in 1983. Thirty-seven Marshall Scholarships have been awarded to West Point graduates, marking the academy as a Marshall Scholarship Center of Excellence.

Gates Cambridge Scholarships

The Gates Cambridge Scholarship was established in 2001 through an endowment by the Bill and Melinda Gates Foundation.

WEST POINT 2010-2011 SCHOLARSHIP WINNERS

Cadet Marc Beaudoin
Harry S Truman Scholarship

Cadet Kelly MacDonald
Harry S Truman Scholarship

Cadet Matthew D. Bolian
Rotary Ambassadorial Scholarship

Cadet Ryan M. Brod
Rotary Ambassadorial Scholarship

Cadet Robert R. Burgin
Rotary Ambassadorial Scholarship

Cadet Salvatore J. Minopoli
Rotary Ambassadorial Scholarship

Cadet Kathryn J. Murphy
Rotary Ambassadorial Scholarship

Cadet Nathan Ramia
Rotary Ambassadorial Scholarship

Cadet Woo S. Do
Rotary Ambassadorial Scholarship

Cadet Jeremy D. Smith
Marshall Scholarship

Cadet Thomas R. Dean
Hertz Foundation Scholarship

West Point is 4th on the list of total winners for Rhodes Scholarships, 4th on the list of Hertz Fellows, and 7th for Marshall Scholarships. In each case, the institutions with more scholarship winners also have larger student bodies.

The scholarship is awarded to graduating college seniors who have proven academic and leadership abilities and shown an interest in issues of global concern, including education, science and healthcare. The scholarship provides recipients one to three years of study leading to a graduate degree from Cambridge University. West Point graduates have received 12 scholarships since first competing, with Cadet Jon Chachula named a Gates Scholar in February 2009.

Harry S Truman Scholarships

The Harry S Truman Foundation scholarship is awarded to college juniors who have demonstrated a dedication to public service. All the service academies began competing for this prestigious scholarship in 1991. Twenty-nine West Point cadets have been awarded the scholarship; Cadets Marc Beaudoin and Kelly MacDonald from the Class of 2011 are the latest Truman scholarship awardees.

George Mitchell Scholarships

The U.S.-Ireland Alliance awards George Mitchell scholarships to 12 graduating American seniors annually for one year of graduate study in Ireland or Northern Ireland. The academy first competed for the scholarship in 2001; since then, five cadets have been selected as Mitchell Scholars.

Rotary Foundation Scholarships

The Rotary Ambassadorial Scholarship provides the opportunity for cadets to earn a Master's Degree during one or two years of study in one of more than 150 countries around the world. The scholarship is awarded periodically by the Rotary Club district that encompasses West Point. The academy has 32 Rotary Ambassadorial Scholars. Cadets Kathryn J. Murphy, Matthew D. Bolian, Nathan Ramia, Robert R. Burgin, Ryan M. Brod, Salvatore J. Minopoli, and Woo S. Do all received the award in 2010.

Fulbright Scholarships

The United States Congress created the Fulbright Program in 1946 as a step toward building international cooperation. With 140 participating countries, it is designed to give scholars the opportunity to observe political, economic, and cultural institutions; exchange ideas, and embark on joint ventures of importance to the general welfare of the world's inhabitants. Cadets first competed for the Fulbright in 2004. Cadets Nathaniel Bastian and Khalil Tawil were the eighth and ninth West Pointers to win Fulbright Scholarships, both from the Class of 2008.

Churchill Scholarships

The Winston Churchill Scholarship provides support for one year of study and research at the University of Cambridge for 12 of the nation's best math, science, and engineering students. The first time the service academies were invited to compete for the Churchill was 2007, and Cadet Elijah Harrington was awarded West Point's first Churchill Scholarship in April of that year.

National Science Foundation Fellowships

Forty-two cadets have been awarded National Science Foundation Graduate Research Fellowships since 1961. Outstanding cadets compete annually for the fellowships, which enable them to pursue graduate study at the universities of their choice. Our newest winners include Elizabeth Betterbed, Iain Cruickshank, and Brandon Dotson, all in the Class of 2010.

Hertz Foundation Fellowships

Since 1969, 38 cadets have won five-year Hertz Foundation Fellowships leading to doctorates in applied physical science disciplines. Academic performance, recommendations, and personal interviews are factors considered by the foundation. Cadet Thomas R. Dean was awarded the Hertz in 2010.

East-West Center Fellowship

Thirty-eight cadets have received the East-West Center Fellowship. This award provides an opportunity for cadets to earn a Master's Degree in studies related to countries of the Pacific Rim at the University of Hawaii's East-West Center. Class of 2010 Cadet David Lee was awarded the East-West Center Fellowship.

The Academic Curriculum

The academy's curriculum offers a balanced education in the arts and sciences, while also permitting cadets to pursue academic specialization in majors of their choice. The two components of the academic curriculum are a broad, general, core program that is prescribed and an elective program that is individually selected. The core curriculum is the foundation of the academic program and provides a foundation in mathematics, basic

SAMPLE 40-COURSE ACADEMIC PROGRAM, BY YEAR

Freshman Year	1	English Composition	Chemistry	Mathematics	History[1]	Psychology
	2	Literature	Chemistry	Information Technology I	Mathematics	History[1]
Sophomore Year	1	Foreign Language[2]	Political Science	Philosophy	Mathematics	Physics
	2	Foreign Language[2]	Economics	Mathematics	Physics	Physical Geography
Junior Year	1	Information Technology II	Engineering Science[3]	International Relations	Elective	Elective
	2	Engineering Science[3]	English; Advanced Composition	Military Leadership	Elective	Elective
Senior Year	1	Engineering Science[3]	Constitutional and Military Law	Military History	Elective	Elective
	2	Military History	Elective	Elective	Elective	Elective

Notes: (1) Assignment of Western Civilization/Regional Studies in World History or United States History. (2) Foreign languages available: Arabic, Chinese, French, German, Portuguese, Russian, Spanish. (3) Cadets pursuing most non-engineering specializations take a three-course engineering sequence in Civil, Computer, Electrical, Environmental, Mechanical, Nuclear or Systems Engineering.

sciences, engineering sciences, information technology, humanities, behavioral sciences and social sciences. This core curriculum, ranging in size from 26 to 30 courses depending upon the major, represents the essential broad base of knowledge necessary for success as a commissioned officer, while also supporting each cadet's choice of academic specialization. It is, in effect, the "professional major" for every cadet, since it prepares each graduate for a career as a commissioned officer in the Army.

The academy curriculum complements the core program by providing the opportunity for study in depth through the elective program, the choice of which leads to a major. Cadets may choose from more than 40 academic majors that cover virtually all the liberal arts, sciences and engineering disciplines one would expect to find in a high-quality, selective college or university of comparable size. At the academy, cadets may enter most majors without restriction. No special grade point averages are established for entry, but there may be a limit to the number of cadets in a particular major. Each study-in-depth program offers cadets an integrative experience – as a course or project – that addresses the overarching academic program goal: to anticipate and to respond effectively to the uncertainties of a changing technological, social, political and economic world.

The baseline path to graduation requires the cadet to complete 10 electives defined by the disciplinary field. For those cadets who desire to enrich their academic experiences and pursue disciplines in greater depth, majors that go beyond the baseline are available on a voluntary basis. Cadets electing these majors must follow more-demanding sequences, with 11 or more electives, and complete a senior thesis or design project. Cadets who maintain a 3.0 grade point average in the core curriculum and a 3.5 average in their majors, and who complete additional course work beyond that prescribed for the majors, may graduate with honors.

To graduate, cadets must successfully complete the baseline requirement of 40 academic courses, seven semesters of physical education and four military science courses, and achieve a cumulative grade point average of at least 2.0. Within the 40 academic courses, cadets must successfully complete or validate each course in the core curriculum and complete a major.

Validation and Advanced Placement

Cadets may be excused from ("validate") certain core courses if they have sufficient knowledge of a subject to meet the appropriate department's standards. Credit earned in other colleges, advanced placement examination scores, and tests administered at West Point are considered in validation decisions. Advanced placement examination scores may be used in mathematics, physics, chemistry, history, social sciences, and foreign languages. Validation of a core course allows a cadet to substitute an additional elective in place of the validated course.

If a cadet shows unusual ability or has prior knowledge of a subject but cannot validate it, he or she may be enrolled in an advanced or accelerated program.

Individual Advanced Study

If a cadet is an exceptional student, he or she may enroll in advanced individual study in many of the disciplines taught at West Point. These programs emphasize independent or tutorial work and are excellent preparation for graduate study.

Individual Advanced Development Program

During the summers before both the junior and senior years, cadets select academic, military, or physical-development programs to enrich their individual development. Cadets may choose from more than 150 academic-enrichment opportunities that normally involve about three weeks of active summer participation in educational experiences and that include, but are not limited to, the following: Operation Crossroads Africa, research work in technical laboratories throughout the United States, immersion language training in foreign countries, medical internships at Walter Reed Medical Center, study at other civilian and military institutions, and numerous work-fellow positions with federal and Department of Defense agencies.

Majors Offered

Mathematics-Science-Engineering
Basic Science
Chemical Engineering
Chemical Engineering Studies
Chemistry
Civil Engineering**
Civil Engineering Studies
Computer Science***
Electrical Engineering**
Electronic/Information Technology Systems
Engineering Management**
Engineering Psychology
Environmental Engineering**
Environmental Geography
Environmental Science
Environmental Engineering Studies
Geospatial Information Science
Information Engineering
Information Technology***
Kinesiology
Life Science
Mathematical Sciences
Mathematical Studies
Mechanical Engineering**
Mechanical Engineering Studies
Nuclear Engineering**
Nuclear Engineering Science
Operations Research
Operations Research Studies
Physics
Systems Engineering**
Systems Management

Humanities-Social Sciences
American Legal Studies
Art, Philosophy and Literature
Defense and Strategic Studies
Economics
Foreign Area Studies:
- Africa
- East Asia
- Eurasia
- Latin America
- Middle East
- Europe

Foreign Language:
- Arabic
- Chinese
- French
- German
- Portuguese
- Russian
- Spanish

History:
- International
- Military
- United States

Human Geography
International/Comparative Legal Studies
Leadership
Management
Military Art and Science
Political Science:
- American Politics
- Comparative Politics
- International Relations

Psychology
Sociology

** Major programs accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.
*** Major programs accredited by the Computing Accreditation Commission (CAC) of ABET, Inc.

The 13 academic departments of the academy, under the direction of the Dean of the Academic Board, are organized to support the core curriculum as well as the more than 40 majors offered at West Point. The Commandant of Cadets oversees the Department of Military Instruction and the Department of Physical Education.

CHAPTER 5

MAJORS & COURSES OF INSTRUCTION

NOTE: For the courses described in this section, first-year courses are numbered in the 100s, second-year courses in the 200s, third in the 300s, and fourth in the 400s. Credit hours represent contact hours and associated preparation; e.g., 3 credit hours are assigned to a course that meets five times within a two week period and requires two hours preparation for each hour in class.

The Behavioral Sciences field directly promotes our understanding of human behavior at individual, small group, organizational and societal levels. Cadets explore underlying causes of behavior, producing military officers who can influence the organizations and societies in which they are expected to lead. In several elective programs – psychology and sociology – emphasis is on understanding as a basis for leader decisions. The elective program in Engineering Psychology examines the technology of human performance and Soldier/machine interface on the modern and future battlefields.

BEHAVIORAL SCIENCES & LEADERSHIP

The Leadership and Management (LMS) program provides cadets the academic foundation for a wide variety of activities particularly important to an Army officer. The professional Army officer of the 21st century is required to understand and apply concepts of leadership and management to lead, sustain and improve organizations in a volatile, uncertain, complex, and ambiguous environment. Cadets will choose to pursue either the leadership or the management option in order to analyze one of the fields in depth. Cadets pursuing the leadership option will study the field of leadership from five levels of analysis: individual, group, leader, organization, and environment. Cadets pursuing the management option will study the field of management from the interdisciplinary bases of human resource management, economic and financial analysis, marketing, quantitative decision-making, and strategy. Cadets studying either field will concurrently gain exposure to courses in the other option. Cadets who major in LMS will culminate their studies by completing a capstone course tailored to their respective options.

Behavioral Sciences Majors

The Department of Behavioral Sciences and Leadership offers majors in the behavioral sciences. Five disciplinary options (majors) are available: Psychology, Engineering Psychology, Leader Development Science, Management or Sociology.

Overall, study of the behavioral sciences provides an opportunity to increase cadet understanding of human behavior at several levels ranging from the individual through small groups, to organizations and social institutions. The courses taught and insights gained improve cadets' ability to describe, explain, predict and influence human behavior. The behavioral sciences majors allow cadets to structure an appropriate sequence of electives that will ensure understanding of behavior from the psychological, as well as the sociological and organizational perspectives. This underlying basis ensures that every program of study in the department has direct and immediate relevance to the lives of our graduates during their careers as Army officers and beyond.

Standard and Advanced Courses

PL100 General Psychology for Leaders

Both Terms—Prerequisite: None.
This course develops the ability to apply current psychological principles. Psychology is a broad and expanding discipline, and the introductory course is necessarily a survey. The focus of the course is the development of an awareness and understanding of one's own behavior and the behavior of others. Emphasis is placed on applying the behavioral principles learned to the cadets' current lives and their functioning as future officers.

3 Credit Hours

PL150 Advanced General Psychology for Leaders

Both Terms—Prerequisite: Permission of the professor.
This course is an advanced multidisciplinary study of human behavior and leadership that focuses current psychological principles to the study and understanding of human thoughts, emotions and behaviors. The focus of the course is the enrichment of an awareness and understanding of one's own behavior and the behavior of others. Emphasis is placed on applying the behavioral principles learned to real-world issues and their impacts on functioning as future Army officers.

3 Credit Hours

PL300 Military Leadership

Both Terms—Prerequisites: PL100, First or Second Class cadets only.
This course is a multidisciplinary study of leadership in an organizational context, which focuses on the integration of theory and practice. The cadet studies the leader's direct influence on individual motivation and group processes through the application of leadership theories, skills, and attributes. The cadet also learns how to influence subordinates indirectly through organizational systems and procedures, organizational culture, and ethical climate. Cadets apply the knowledge gained in the classroom to their experiences as cadet leaders in the Corps of Cadets. In addition, the course helps each cadet develop usable leadership products in the form of a reflective leadership notebook, which helps the cadet define and inform his or her own personal approach to leading. The cadet will also develop a detailed and theoretically sound leadership philosophy, as well as comprehensive leader plans that have direct application to their roles as leaders in the Corps of Cadets and as future Army officers.

3 Credit Hours

Elective Courses

PL350 Advanced Military Leadership

Both Terms—Prerequisites: PL100, Second or First Class cadets only and permission of the course director.
This course is an advanced multidisciplinary study of leadership in an organizational context that focuses on the integration of theory and practice. The cadet studies the leader's direct influence on individual motivation and group processes through the application of leadership theories, skills, and attributes. The cadet also learns how to influence subordinates indirectly through organizational systems and procedures, organizational culture, and ethical climate. Cadets apply the knowledge gained in the classroom to their experiences as cadet leaders in the Corps of Cadets. The cadet will also develop a detailed and theoretically sound leadership philosophy, which will have direct application to their roles as leaders in the Corps of Cadets and as future Army officers.

3 Credit Hours

PL360 Psychology of Elite Performance

First Term—Prerequisite: PL100.
This course focuses on the psychological theories and applied techniques that enhance elite performance. In every performance endeavor, human beings have consistently exceeded

our wildest expectations. While this has been significantly affected by the technological advances, physical training, an equally, if not more significant part of these advances, has been the systematic approach to psychological skills training. This approach makes performance enhancement a reality to all who are seeking to perform to their full potential, regardless of the arena in which they perform. This course reviews the current theories that underlie performance enhancement training techniques and relates them to all areas of elite level performance (academic, physical, athletic, and specific areas of military training.) Topics include the development and maintenance of self-confidence, goal setting, attention and concentration, energy management, cognitive and somatic coping strategies, visualization, leadership, and team cohesion. Students will not only understand the theoretical bases underlying these topics, but apply them, through a series of individual projects, a semester-long group research project, and weekly individual instruction, to personal areas of importance.

3 Credit Hours

PL361 Research Methods I

Both Terms—Prerequisite: PL100.

This course provides cadets with detailed practical knowledge and skills in the scientific analysis of human behavior. The course content begins with a review of the terms and philosophy of the scientific method as well as basic research concepts. Several research designs, primarily non-experimental methods, provide cadets with a better understanding of research techniques and how they affect the results of a study. Basic methods of data analysis, to include descriptive and inferential statistics, will be covered. Groups of cadets will conduct research projects on a topic of their choice using naturalistic observation.

3 Credit Hours

PL371 Introductory Sociology

Both Terms—Prerequisite: PL100.

Sociology is the scientific study of society and the interactions among humans. The goal of Introductory Sociology is to provide a survey of the field of sociology and educate and inspire cadets to examine contemporary situations that involve social interaction and use sociological concepts, theories, and research to explain what is taking place, identify social threads and patterns across the situations, and determine the personal as well as the social significance of their analysis. Sociology demands that the student transcend the taken-for-granted, subjective world view and develop a sociological imagination by revealing the linkages and relationships among social facts and connect public issues to self awareness. PL371 is a survey course with the identification of common threads across social situations, and determination of the self and social significance of facts. The teaching and learning strategy involves reading, writing, discussing, making presentations, and other active-learning, hands- and heads-on projects.

3 Credit Hours

PL372 Marriage and the Family

Second Term—Prerequisite: PL100.

This course focuses on contemporary American families, with special emphasis on military families. It approaches the study of marriages and families from a scientific perspective, based on scholarship and research. Cadets will learn about the actual state of marriages and families in the United States, and particularly within the military population. This course uses the sociological perspective to analyze issues, as well as several other academic disciplines, such as psychology, anthropology, biology, physiology, and economics to provide additional information. Cadets will examine past and present forces that contribute to changes in the nature of marriage and families in the United States. They will explore the nature of relationships between the family and other major social institutions. They will also evaluate contemporary issues, policies, and research related to marriages and families in order to determine the social significance of these situations.

3 Credit Hours

PL373 The Lifecycle and Human Development

First Term—Prerequisite: PL100.

This course focuses on individual development and the forces that influence our development from birth to old age. Cadets will study the various facts, theories, issues, and topics that constitute the field of human development. Cadets will explore human development from various theoretical perspectives. In addition, cadets will discuss such topics as cognitive and moral development, how our self-concept and sense of identity form, and the influence of family and the world around us on development. Special attention will be given to the developmental impact of college.

3 Credit Hours

PL376 Personality and Abnormal Psychology

Second Term—Prerequisite: PL100.

Building upon the elementary concepts of personality from PL100, this course examines in detail various theoretical frameworks used to study personality and abnormal behavior. The course focuses on four theoretical perspectives: the psychoanalytic, learning, phenomenological, and dispositional perspectives. After examining how the various theoretical perspectives can be used to explain personality, the course applies these perspectives to an understanding of abnormal behavior. Thus, the course focuses on developing the cadets' understanding of "normal" personality development and how and why deviant behavior may result.

3 Credit Hours

PL377 Social Inequality

First Term—Prerequisite: PL100.

Cadets are introduced to several theoretical perspectives intended to explain the structure of social stratification in the United States. The course examines the state of social inequality in the United States, with a focus on social class, integration, mobility, and equality of opportunity. Cadets explore individual and structural perspectives of social inequality. Cadets evaluate social issues, policies, and programs intended to influence social inequality. Throughout the course, cadets discuss the relevance of class, race, ethnicity, and gender on social opportunity and inequality.

3 Credit Hours

PL379 Group Dynamics

First Term—Prerequisite: PL100.

This course is designed to improve cadets' understanding of human behavior in small group/team settings. Course content includes structural characteristics of teams, such as size, status, roles and norms, in addition to the effects of task and environment. Cadets then use their understanding of these constructs to analyze team phenomena, such as cohesion, performance, decision making, problem-solving and conflict resolution. We also devote a number of lessons to current issues such as electronic and virtual groups, high performance work teams, and shared leadership in a team environment. The course is particularly relevant to professional development in that cadets gain a comprehensive understanding of the dynamics of small-group and team interaction. This allows them to develop and implement creative leader actions that will maximize unit/team effectiveness.

3 Credit Hours

PL383 Experimental Social Psychology

First Term—Prerequisite: PL100.

This course surveys the field of contemporary social psychology. Cadets examine the impact of social structure and group membership on social behavior, while focusing on intra-psychic processes such as attribution, cognition, and learning that underlie social behavior. The course is intended to enable cadets to more effectively analyze and explain human behavior in a given situation. Specific topics include the self, attitudes and attitude change, sex and gender, conformity, obedience, compliance, deviance, helping behavior, aggression, attraction and romance, groups and intergroup relations, and collective behavior. The classroom experience is heavily discussion-oriented in order to maximize the application of social psychological concepts, theories, and perspectives to daily life.

3 Credit Hours

PL384 Sociological Theory

Second Term—Prerequisites: PL100, PL371.

Sociological theory is a set of interrelated ideas that allow for the systemization of knowledge of the social world, the explanation of that world, and predictions about the future of the world. In some ways, all of us are amateur theorists, interpreting the meanings of the events and encounters that shape the world and ourselves. In PL384 cadets will learn in-depth how theories can help make sense of our times and how to choose courses of action to realize our collective and individual dreams. In this course, theory is brought down-to-earth to show how a sociological imagination (in other words, a theoretical consciousness that embraces self-awareness) is valuable to self and society. Questions like "Are families disintegrating?" "Why are some people discriminated against?" "What accounts for the crime rate?" "Are religion and economics compatible?" "Why is the sexual division of labor so persistent?" "Are wars inevitable?" can be addressed. Theories are thus tentative answers to the questions that preoccupy us as members of families, professions, communities, nations and, increasingly, as global citizens.

3 Credit Hours

PL386 Experimental Psychology

First Term—Prerequisite: PL100.

This course provides cadets with detailed practical knowledge and skills in the experimental analysis of behavior and human performance. Particular emphasis is placed on design of laboratory and field experiments, laboratory automation and instrumented data acquisition, computer data analysis, and on the distinction between laboratory

research, field test and evaluation. The course includes practical exercises in several content areas of experimental and engineering psychology. These topics are evaluated by laboratory reports.

3 Credit Hours

PL387 Foundations of Counseling

Both Terms—Prerequisite: PL100.

This course introduces cadets to the fundamentals of counseling. It focuses on the practical applications of counseling theories, principles, and techniques. Using the vehicles of videotaping and audio taping, the course emphasizes personal, performance, career, and disciplinary counseling to help prepare cadets for leadership roles both as a cadet and an officer. The course covers the counseling process and the dynamics of interpersonal relationships within that process. Counseling skills include: basic and advanced communication skills, goal-setting, intervention strategies, assertiveness, crisis intervention, and multiculturalism. Examinations are behavioral and written.

3 Credit Hours

PL390 Biological Psychology

First Term—Prerequisite: PL100.

This course introduces the cadet to the physiological and anatomical structures and processes that underlie human behavior with emphasis on human performance. The course examines the structure of the nervous and endocrine systems, the mechanisms of seeing and hearing, movement, stress and arousal, learning, memory, biological causes of abnormal behavior, sleep, and language, and the effects on performance of damage to neural structures. Cadets are introduced to the scientific examination of real-world bio-psychological problems in laboratory assignments in examining tissue, brains, and eyes to provide three-dimensional realism to classroom instruction. This course provides the basis for competence in later engineering psychology electives. Biological Psychology is the "hardware" introduction to engineering psychology.

3 Credit Hours

PL391 Sensation, Perception, and Psycho-Physics

First Term—Prerequisites: PL390, PL386, MA376.

This course covers the acquisition and analysis of information by the human nervous system from examination of the physical properties of light and sound, the functioning of the visual, auditory systems and the kinesthetic processes, and the theoretical background of contemporary perceptual research. The following general topics are covered: psychophysical methods, including measurement, scaling and signal detection theory; physiology of the visual, auditory and kinesthetic systems; recognition of color and brightness, pitch and loudness, patterns, features, and the role of visual channels; visual detection and tracking; the role of kinesthesis in military applications; and research methodology in perception. Laboratory assignments stress the application of data acquisition systems on research and the construction of strictly defined experimental methods in this area of research.

3 Credit Hours

PL392 Cognitive Psychology

Second Term—Prerequisites: PL100, PL361, PL386, MA376, SE380, EM384.

This course addresses the processes of human information gathering, learning, and memory using an information-processing model. The course deals with cognitive theory and application, including stage models of processing and memory, machine models and artificial intelligence, and research methodology in these areas. Emphasis is placed on practical military applications in such areas as pattern recognition and detection, text processing, visual search and associated problems. Laboratory experiences stress development of experimental paradigms in this area of investigation and the use of test instrumentation, and computer software models to investigate cognitive processing.

3 Credit Hours

PL393 Criminology—Criminal Justice System

First Term—Prerequisite: PL100.

Criminology is the scientific study of the making of laws, the breaking of laws, and the reaction to the breaking of laws. When a crime appears to have been committed and authorities have been notified, the criminal justice system is set in motion. The criminal justice system is the societal response to crime and includes three major activities: law enforcement, the judicial process, and corrections. The course provides an overview of (a) the theories offered to explain crime and delinquent behavior, (b) the criminal justice system that responds to those behaviors, and (c) the relationships between the varied explanations of criminal behavior and society's criminal justice responses to those behaviors. The focus of the course is primarily on the United States, but there is some attention devoted to an international view of crime and criminal justice.

3 Credit Hours

PL394 Anthropometrics and Biomechanics

Second Term—Prerequisites: PL390.

Virtually every activity in which humans engage involves interacting with our environment. Much of that interaction requires physical movement. Creating a safe workplace requires an understanding of the forces we apply to objects in our environment and how those forces can be measured and modified by better design. Anthropometrics is the study of human measurement. Biometrics is the study of forces on our muscular and skeletal system. The goal of this course is to teach cadets the fundamentals of anthropometrics and biomechanics so that they will be able to modify work environments of injury. The course will emphasize work performed in military settings.

3 Credit Hours

PL398 Leadership Theory and Development

Second Term—Prerequisite: PL300.

This course focuses on the "cutting edge" concepts and theories of leadership and leader development that are designed to help cadets better understand the leadership process to enhance leadership effectiveness and organizational performance across multiple levels of analysis. The course addresses leadership from not only the focal leader perspective, but also from the organizational, strategic, and combat leadership viewpoints. The course will examine the historical evolution of leadership theory and will emphasize scientific research and the empirical supports for existing leadership theories, and current thinking on the effective development of leaders. Additionally, cadets will study some of the emerging leadership perspectives that have been proposed to be relevant for effective leadership in the volatile, ambiguous, uncertain, and chaotic world of the 21st century.

3 Credit Hours

PL399A Behavioral Sciences and Leadership Practicum

Second Term

The Department of Behavioral Sciences and Leadership's Academic Individual Advanced Development (AIAD) program is designed to give cadets practical experience in their fields of study and to reflect on their experiences by completing specified academic requirements. Recent AIADs have involved internships with the American Psychological Association, studies of psychological support to NATO operations in France and stress in military operations in Norway, as well as other topics at West Point, elsewhere in the continental United States, or overseas. Scope, depth and material covered will meet the requirement of a two-credit-hour course in the department. Grades are determined based on preparatory briefings and essays, a journal of daily activities or weblog with instructors, the quality of the work performed during the internship, student evaluation of the experience, and a final paper, briefing, or exam that incorporates their experiences with a topic from their field of study, due upon return.

2 Credit Hours

PL462 Experimental Apps in Psychology

First Term—Prerequisite: PL361.

This seminar-based course focuses on the advanced study of topics in psychology. It provides cadets an opportunity for reading and analysis in-depth in a topic area of interest and relevance to the study of psychology and its applications. The course employs a seminar approach in which cadets present their own analyses of the discussion topics to the group. By the end of this course, cadets will be able to conduct and evaluate research in the behavioral sciences. This course continues the themes of PL361 (Research Methods I) and introduces cadets to more-varied experimental and non-experimental designs and more-complex statistical analyses. Groups of cadets will conduct research projects using experimental methods in areas of their choice. Cadets who complete this course will be competent consumers of behavioral sciences research and will be equipped to use the scientific method to investigate and solve many of the problems they will face as military leaders.

3 Credit Hours

PL470 Special Topics in Behavioral Science and Leadership

Both Terms—Prerequisites: PL100 and permission of the professor.

This course explores an advanced topic in Behavioral Sciences and Leadership. Specific subject matter will vary with the expertise of the senior faculty member conducting the course.

3 Credit Hours

PL471 Leadership in Combat

Both Terms—Prerequisite: PL300.

PL471 examines leadership in combat at the tactical level from an interdisciplinary perspective. It first seeks to provide a theoretical foundation for understanding human dimensions of combat, and then explores some of the factors that influence the leadership of Soldiers in combat through a collection of readings, film, and first-hand discussions with combat veterans. Cadets examine four case studies and conduct a comparative analysis of two combat leaders.

3 Credit Hours

PL472 Cross-Cultural Organizational Behavior

Both Terms—Prerequisite: PL300.

This course examines the individual, group, and organizational level influences on human behavior in the international arena. Cadets will gain an understanding of these influences and use the insights gained to formulate leader actions to effectively motivate and manage in a global environment. The course emphasizes the practical application of management theories and research findings in the international situations that cadets encounter in their personal lives and in the field Army with an increasing emphasis on the global environment. Course content includes foundations of individual behavior, diversity, motivation, decision-making, rewards, feedback, and power and influence in an international setting. We will also examine organizational influences on ethical behavior in the global arena with an emphasis on creating ethical climates in the organizations to which we belong.

3 Credit Hours

PL475 Human-Computer Interaction

First Term—Prerequisite: PL392.

Computer use in the world today is at an all-time high. Consequently, the need for user-friendly computers is crucial. Somewhat ironically, human capacity for memory has often been explained using the computer metaphor, while the computer designer often attempts to instill human-like qualities into their computer designs. This course focuses on the interface between the human and computer. Initial focus is placed on understanding the theoretical foundations of human processes. The course then examines how these processes interact with computer usage. Students will learn design principles that enhance compatibility with computer systems.

3 Credit Hours

PL476 Educational Psychology

First Term—Prerequisite: PL100.

In this course, cadets will develop their instructional skills and formulate a conceptual basis for their instructional practices as army officers. The course is oriented toward the study of psychological theories of learning and application of these theories to the design, delivery, and evaluation of adult education and training. The course is subdivided into major areas of study. Learning theory focuses on the study of the learning process with balanced treatment given to behavioristic and cognitive perspectives. Instructional design emphasizes a systems approach to planning and decision-making in learning situations.

3 Credit Hours

PL479 Leading Organizations through Change

First Term—Prerequisite: PL300.

The environments in which organizations operate are characterized by unprecedented change fueled by rapidly emerging technologies, information overload, changing values, lifestyles and attitudes, and social and civil problems of great magnitude. Effective leaders either must be proactive toward change or be its captive. The purpose of this course is to examine change from an organizational perspective through a complex and diverse mix of theories, concepts, and information. Course concepts are drawn from the disciplines of behavioral science, business, management, and military doctrine. Cadets have the opportunity to analyze the successes, the failures, and the multiple dilemmas of modern organizations in both the private and public sectors in order to better understand the causes, implications, and potential leader actions and strategies associated with organizational change.

3 Credit Hours

PL482 Armed Forces and Society

Second Term—Prerequisite: PL300.

The intersection of armed forces and society involves the examination of two domains: the intersection of any armed force and the larger societal context and the focused study of the military as a unique social institution with a set of demands placed on the people making up the institution. Our principal focus is sociological as we use sociological theories, concepts, and research to study the military and society and culture both in the United States and abroad. PL482 is primarily a discussion course. The course expects cadets to read, write, and discuss military and society issues in-depth. Cadets integrate their knowledge gleaned from the course into a coherent and focused research project addressing any aspect involving the human dimensions of the armed forces and society.

3 Credit Hours

PL485 Human Factors Engineering

First Term—Prerequisite: PL392.

This course surveys the theories and methods of human factors engineering (ergonomics). Human factors engineering is concerned with the application of technology and the design of equipment for human use. This course emphasizes the cognitive dimension of human factors engineering. The focus is on understanding the capabilities and limitations of humans as they interact with equipment and facilities. This course lays the foundations for the systematic application of information about humans to the design of equipment and workspace environments.

3 Credit Hours

PL488 Colloquium in the Behavioral Sciences (488B, C, D)

Both Terms—Prerequisite: First Class Psychology Major.

The colloquium focuses on advanced study of behavioral science topics and issues using small group discussions of important books and articles of both traditional and contemporary topics in psychology, sociology, organizational leadership, and engineering psychology. It is a reading and discussion course. Subcourse topics are not fixed and are subject to annual revision.

3 Credit Hours

PL490 Engineering Psychology

Second Term—Prerequisite: First Class Engineering Psychology Major.

This course integrates the material previously covered in the Human Factors curriculum, especially PL485 Human Factors Engineering. It uses the theoretical bases and practical applications of Human Factors Engineering in the treatment of design problems. Emphasis in this course is on the design of systems to fit human capabilities. Course project is a design project of a contemporary applied problem.

3 Credit Hours

PL497 Seminar in the Behavioral Sciences

First Term—Prerequisite: Open to majors only.

Cadets develop individual research themes from contemporary behavioral science topics. They are then grouped under a seminar leader for study, discussion, and preparation of their research reports, culminating in a presentation before the seminar group. Cadets will be expected to master both the significant work within the topics of choice and the body of criticisms of the works and to propose a study to advance the body of knowledge.

3 Credit Hours

PL498 Advanced Individual Study in the Behavioral Sciences

Second Term—Prerequisite: Successful completion of PL497. Open to majors only.

This course allows selected cadets to design an advanced study project under the guidance of a member of the BSL faculty. The advanced study, designed with the guidance of the faculty advisor, can be a thesis, research program, or service learning project. Depending on the nature of the project, cadets will work individually or in small groups. Cadets may conduct work in such areas as Leadership, Engineering Psychology, Sociology, or Psychology.

3 Credit Hours

PL499 Leaders in Action

Second Term—Prerequisite: First Class cadets only.

This course is designed to enhance cadets' leadership performance through the application of essential leadership skills in challenging, on-going, real-world projects and scenario-driven leadership laboratory exercises. The course uses a series of "concept study > actions > reflections" (CAR) cycles to focus students on the enhancing (and hindering) factors that typically surface when an individual has responsibility for executing a project and "must-do" leadership. Cadets move through a CAR cycle in three related stages: First, cadets consider specific concepts, theories, and models of leadership covered in prior courses. Then, using a pool of projects resourced by the faculty expressly for this course, cadets wrestle with real-world leadership projects (such as leading an organizational unit through an unexpected change), keeping these issues and insights in mind. Finally, both during and after the project, cadets engage in self-reflection exercises (e.g., journals) and meet with faculty mentors to help process and make sense of their leadership experience on both a personal and conceptual level.

3 Credit Hours

MG379 LEADING TEAMS

Both Terms—Prerequisite: PL100.

This course is designed to improve cadets' understanding of human behavior in small-group/team settings. Course content includes structural characteristics of teams, such as size, status, roles, and norms, in addition to the effects of task and environment. Cadets then use their understanding of these constructs to analyze team phenomena such as cohesion, performance, decision making, problem-solving and conflict resolution. We also devote a number of lessons to current issues such as electronic and virtual groups, high-performance work teams, and shared leadership in a team environment. The course is particularly relevant to professional development in that cadets gain a comprehensive understanding of the dynamics of small-group and team interaction. This allows them to develop and implement creative leader actions that will maximize unit/team effectiveness.

3 Credit Hours

MG380 Marketing

Second Term—Prerequisite: None.

The objective of this course is to introduce students to the concepts, analyses, and activities that comprise marketing management, and to provide practice in assessing and solving marketing problems through the use of case studies and real-world projects in both the military and civilian realms. Topics include competitive analysis, marketing strategy, customer behavior, segmentation and targeting, market research, pricing, and promotion. Graded requirements include a combination of WPRs, written projects and student led discussions. This course is required for cadets pursuing the Management major.

3 Credit Hours

MG381 Introduction to Management

First Term—Prerequisite: None.

This course serves a dual purpose: It is an introduction to the concept of management as well as an introduction to the multidisciplinary nature of the management field of study. This course focuses on the managerial activities that organizational leaders use to effectively and efficiently direct the resources of organizations. As a result, the course is structured around the primary concepts of planning and decision-making, organizing, leading, and controlling. In addition, cadets will examine the concepts of ethical and global management as they learn to analyze operating environments, assess organizational capabilities, and develop feasible courses of action.

3 Credit Hours

MG382 Human Resource Management

Both Terms—Prerequisite: PL300.

This course begins with the premise that people are a firm's most important resource, and that the management of this critical resource ultimately determines the success or failure of the organization. The course examines the behavioral science principles used to foster the creation of effective work environments – environments specifically designed to elicit motivation, commitment, productivity, and satisfaction. The course gives special attention to how human resource management (HRM) practices can give a firm a competitive advantage by using high-performance work systems, tending to stakeholders' (customers, employees, stockholders, and the community) needs and through strategic globalization. By analyzing HRM practices in terms of these three critical organizational outcomes, students learn how to apply HRM concepts to positively influence the success of the organization.

3 Credit Hours

MG390 Negotiations for Leaders

Second Term—Prerequisite: None.

This course immerses cadets in fundamental-level negotiations and bargaining theory and application. The course progresses from dual-party, single-issue, distributive scenarios to multi-party/multi-issue/integrative scenarios. Cadets learn and practice systematic ways to devise an effective strategy prior to entering a negotiation and then actually apply bargaining tools and tactics during the negotiation in order to accomplish their individual and organizational goals. Cadets learn concepts and frameworks that help them analyze and understand human behavior so that they have a perspective from all parties involved in a negotiation. Examinations are behavioral and written. Emphasis is placed on applying the behavioral principles learned to real-world issues and their impacts on functioning as future Army officers.

3 Credit Hours

MG395 Fundamentals of Accounting

Second Term—Prerequisite: MA206.

The purpose of MG395 is to provide and integrate the analytical tools learned in this and other courses in a management setting. Specifically, this course will provide the fundamentals of understanding, developing, and analyzing financial statements (income statement, statement of retained earnings, balance sheet, and statement of cash flows), using accounting ratio analysis, analyzing inventory, understanding costing systems, and budgeting. By applying the various accounting techniques in a managerial setting, cadets will be better prepared to quantitatively support their managerial decisions. This course is required for cadets pursuing the Management major.

3 Credit Hours

MG410 Managerial Finance

First Term—Prerequisites: MA206 and MG395.

The purpose of MG410 is to provide Management majors with the basic principles of managerial finance, and then to apply these principles in the context of managerial decision-making. Specifically, this course will cover: the fundamentals of the time value of money, the meaning and measurement of risk and return, valuation techniques for stocks and bonds, and standard techniques for financial analysis, to include capital budgeting, discounted cash flow valuation, and weighted average cost of capital. Cadets will leave this course with a solid understanding of how financial managers at the corporate level balance risk and return, and, thus, manage everyday financial decision-making. This course is required for all management majors.

3 Credit Hours

MG420 Operations Management

First Term—Prerequisite: MA206.

The purpose of MG420 is to provide cadets with the tools to deal with the quantitative aspects of design and analysis of operations management. Emphasis is on identification, analysis, and solution of production problems using applied quantitative techniques using the case study technique. In addition to case studies, simulations reinforce the problem-solving techniques necessary for today's successful managers. Specific methods and techniques taught and applied are operations strategy, product design and selection, supply chain management, total quality management, forecasting, capacity planning, facility location, facility layout, work system design, inventory management, material requirements planning, and scheduling. This course is required for cadets pursuing the Management major.

3 Credit Hours

MG421 Strategic Management

Second Term—Prerequisites: MG381, PL375, PL381, SS394, and SS494; First Class cadets only.

This capstone course for management majors emphasizes the integration of concepts and principles found in all previous management courses as they relate to the strategic management of public, private, and military organizations. This course focuses on all aspects of the strategic management process to include: the identification of opportunities and threats in a competitive environment, the development of organizational core competencies, and the strategic alternatives available to organizations as they seek to achieve their goals in a highly dynamic operating environment filled with complexity, uncertainty, and risk. MG421 uses the case-study method that requires comprehensive, in-depth analysis of realistic management situations.

3 Credit Hours

MG472 International Management

Second Term—Prerequisite: PL300.

This course examines the individual, group and organizational level influences on human behavior in the international arena. Cadets will gain an understanding of these influences and use the insights gained to formulate leader actions to effectively motivate and manage in a global environment. The course emphasizes the practical application of management theories and research findings in the international situations that cadets encounter in their personal lives and in the field Army with an increasing emphasis on the global environment. Course content includes foundations of individual behavior, diversity, motivation, decision making, rewards, feedback, and power and influence in an international setting. We will also examine organizational influences on ethical behavior in the global arena with an emphasis on creating ethical climates in the organizations to which we belong.

3 Credit Hours

The Department of Chemistry and Life Science presents a two-semester general chemistry course to all Fourth Class cadets. The purpose of this course is to contribute to each cadet's background those fundamental principles of chemistry and modern experimental techniques that are vital to an understanding of our external environment. The course is also fundamental to success in subsequent scientific and engineering courses and is necessary for continued intellectual growth and development as a professional officer. The department also

provides elective courses that support a Chemistry Major, a Life Science Major and a Chemical Engineering Major. Each of these programs prepares cadets for service in any of the branches of the Army and for graduate studies in chemistry, chemical engineering, or the life sciences or for medical school.

Chemistry, Life Science, and Chemical Engineering Majors

The Department of Chemistry and Life Science offers separate majors for cadets with an interest in chemistry, chemical engineering, or the life sciences. Many of the department electives have practical laboratory work integrated with the classroom instruction to improve the individual's fundamental understanding of complex concepts and processes. Particular emphasis is directed toward practical applications. Scientific maturation is expected, especially in the areas of experimental observations, organization and use of data, deductive reasoning, problem solving, logical decision-making, technical writing ability, and delineation of conclusions.

Core Courses

CH101/CH102 General Chemistry I & II

Both Terms—Prerequisite: None.
This is a general chemistry course that emphasizes the fundamental concepts, principles, theories, and the laws of chemistry. It includes an integrated laboratory program.

3.5 Credit Hours

CH151/CH152 Advanced General Chemistry I & II

Both Terms—Prerequisite: Selection by the department.
This course is an advanced introduction to physical, organic, inorganic, and analytical chemistry. Fundamental concepts, principles, theories, and laws of chemistry are stressed. The integrated laboratory program emphasizes both classical and modern investigative techniques.

3.5 Credit Hours

Elective Courses

CH457 Microbiology

First Term—Prerequisite: CH375.
This course is an introduction to general microbiology with coverage of a broad range of information with emphasis on microorganisms in the disease process and application of microorganisms in ecology, sewage disposal, food production, and molecular biology.

3.5 Credit Hours

CH362 Mass and Energy Balances

Second Term—Prerequisite: CH102 or CH152.
This course introduces the traditional chemical engineering topics of mass and energy balances in nonreactive and reactive systems and single phase and multiphase systems.

3.5 Credit Hours

CH363 Separation Processes

First Term—Prerequisite: CH362.
This course covers methods for the physical separation of chemicals. Topics include dew point and bubble point calculations, adiabatic flash, distillation, chromatography, liquid-liquid and gas-liquid absorption. Cadets are taught the significance of staging of unit operations.

3.5 Credit Hours

CH364 Chemical Reaction Engineering

Second Term—Prerequisite: CH362.
This course studies the effects of chemical kinetics on systems of engineering significance. It introduces selection and operation of commercial chemical reactors, emphasizing chemical kinetics and transport phenomena.

3.5 Credit Hours

CH371 Introduction to Analytical Chemistry

Both Terms—Prerequisite: CH102 or CH152.
The course teaches the fundamental concepts of analytical chemistry. Topics include acid-base equilibria, redox potentials, complexiметric titrimetry, separations, electrochemistry, and absorption spectroscopy. The course provides an overview of modern analytical techniques being used in various fields.

3.5 Credit Hours

CH375 Introduction to Biology

Second Term—Prerequisite: CH101 or CH151.
This course consists of an examination of the unity and diversity of life. It investigates why there are so many different life forms and proceeds through Mendelian Genetics, the discovery of cells and chromosomes, DNA replication, and genetic expression. These topics then serve as a foundation knowledge supporting the study of population genetics, biodiversity, bioenergetics, animal and plant physiology, population ecology, and ecosystem ecology.

3.5 Credit Hours

CH383 Organic Chemistry I

First Term—Prerequisite: CH102 or CH152.
This course is an introduction to the relationship between chemical structure and the physical and chemical properties of organic molecules. The concept of mechanism of reaction is explored and a laboratory program is included.

3.5 Credit Hours

CH384 Organic Chemistry II

Second Term—Prerequisite: CH383.
This course builds on CH383 and explores the reactions of major functional groups. The laboratory capstone synthesis introduces the use of scientific literature and provides an opportunity for individual, guided investigation.

3.5 Credit Hours

CH385 Introduction to Cell Biology

Both Terms—Prerequisite: CH102 or CH152.
The course will cover the structure and function of prokaryotic and eukaryotic cells. Emphasis will be placed on research methods and techniques that have led to our understanding of how the cell works.

3.5 Credit Hours

CH387 Human Physiology

Second Term—Prerequisite: CH375.
This course develops the fundamental principles of human structure and functions, including elements of cell morphology and functions, human anatomy, and physiology. Laboratory exercises are included.

3 Credit Hours

CH388 Genetics

First Term—Corequisite: CH375.
Genetics is the science of heredity. It is concerned with the physical and chemical properties of an organism's genome, how the genome is transmitted from one generation to the next, and how genes are expressed in the development and function of an organism.

3 Credit Hours

CH400 Chemical Engineering Seminar

Second Term—Prerequisite: CH102 or CH152.
The course will meet once per week and will cover topics such as ethics, continuing education, and global and social issues within chemical engineering. Special emphasis will be placed on topics of current public or military interest. Presentations by guest lecturers who are experts on relevant topics will supplement the course content. Several lessons will be allocated to curriculum review and preparation for the FE exam.

1 Credit Hour

CH402 Chemical Engineering Design

Second Term—Prerequisite: CH459.
This course provides a capstone experience that brings together material from previous courses to examine problems in chemical engineering process design. It provides instruction in the conceptual design of process networks to achieve a design goal as well as the optimization of the network.

3.5 Credit Hours

CH459 Chemical Engineering Laboratory

First Term—Prerequisites: CH362, CH363, and CH364.
This course provides laboratory experience in selected chemical engineering unit operations, such as gas absorption, evaporation, distillation, liquid-liquid extraction, cooling tower operation, chemical reactors, heat transfer, and mass transfer/diffusion studies.

3.5 Credit Hours

CH460 Human Anatomy

Second Term—Prerequisites: CH102, CH385, and CH387.
This course is designed to provide cadets with a detailed study of the anatomical structure of the human body. The laboratory study will involve working with human skeletal collections and virtual dissection of cadavers and preserved specimens.

3.5 Credit Hours

CH471 Applications of Polymer Chemistry

Second Term—Prerequisite: CH102 or CH152.
This course is a study of modern polymer chemistry that provides an introduction to macromolecules, their synthesis, and properties. It covers polymerization methods, the morphology and characterization of polymers.

3.5 Credit Hours

CH472 Inorganic Chemistry

Second Term—Prerequisites: CH384 and CH481.
This course features an in-depth study of the elements focusing on main-group elements and transition metals. An introduction to coordination chemistry and organometallic compounds is included.

3.5 Credit Hours

"Timid men prefer the calm of despotism to the boisterous sea of liberty."

Thomas Jefferson

CH473 Biochemistry

Second Term—Prerequisites: CH384.
This course develops an appreciation of the chemical processes that occur within living organisms. The coverage includes the structure, functions and regulation of biomolecules and bioenergetics.

3.5 Credit Hours

CH474 Instrumental Methods of Analysis

First Term—Prerequisites: CH371 and PH202. Corequisite: CH384.
This is primarily a laboratory course designed to develop proficiency in the selection and use of modern instrumental methods to solve real chemical problems. Methods introduced are various spectroscopic techniques, gas chromatography and electrochemical techniques.

3.5 Credit Hours

CH479 Methods and Applications of Biotechnology

Second Term—Prerequisites: CH457 and CH388.
This course is intended to reinforce topics learned in other life science courses by studying laboratory and practical applications of biotechnology. Laboratories will concentrate on biotechnology methods including purification, separation, and identification of DNA, RNA, and protein. Classroom lessons will include discussions of assigned readings on the modern applications of biotechnology.

3.5 Credit Hours

CH481 Physical Chemistry I

First Term—Corequisite: CH383.
This course provides an in-depth study of the three major areas of physical chemistry: thermodynamics, equilibrium, and kinetics. The kinetic theory of gases, ion transport, and molecular reaction dynamics are a few of the specific topics covered. A laboratory program is included to illustrate the fundamental topics covered through precision measurements, utilizing modern instrumental methods.

3.5 Credit Hours

CH482 Physical Chemistry II

Second Term—Prerequisite: CH481.
This course builds on the concepts covered in CH481, investigating such topics as quantum chemistry, statistical thermodynamics, and changes of state. The behavior of atoms and molecules in chemical reactions is studied in depth. A laboratory program is included to illustrate the fundamental topics through the use of modern instrumental methods.

3.5 Credit Hours

CH487 Introduction to Spectroscopy

Second Term—Prerequisite: PH202.
This course provides further development of the necessary theoretical background and an introduction to the spectroscopic methods applied to the study of molecular structure and species identification. Topics include electronic and vibrational energy levels of polyatomic molecules, optical selection rules, absorption, fluorescence, and photodissociation.

3 Credit Hours

CH489/CH490 Individual Research

Both Terms—Prerequisite: Approval of head of the department.
This course consists of individual, supervised research in a selected problem area approved by the department. The cadet must outline his/her approach, determine equipment, and develop procedures. The submission of a research paper is required.

3 Credit Hours

The Department of Civil and Mechanical Engineering provides a program of engineering study that emphasizes creative problem solving and hands-on engineering design in the fields of civil and mechanical engineering. These programs develop in the student an understanding of the practical applications of science essential to officers in a modern and highly technical Army. For cadets who want to concentrate in the field of engineering, the department offers degrees in civil engineering and in mechanical engineering that are accredited by the Engineering Accreditation Commission of ABET, Inc., www.abet.org. The department also offers three-course engineering sequences in either civil or mechanical engineering that cadets may choose to satisfy the core engineering requirement. Both emphasize engineering science fundamentals, creative problem solving and hands-on engineering design to develop cadets' understanding of the practical applications of science essential for officers in our modern, high-technology Army.

CIVIL & MECHANICAL ENGINEERING

Core Sequences in Civil and Mechanical Engineering

The Department of Civil and Mechanical Engineering offers two three-course core sequences, one in Civil Engineering and the other in Mechanical Engineering. Either sequence may be taken by the non-engineering cadet to fulfill the core requirement for engineering science and design. One fundamental engineering science course is common to both the Civil and the Mechanical sequences: MC300 Fundamentals of Engineering Mechanics and Design. This foundation course is followed by a two-course sequence in either civil or mechanical engineering: CE350 Infrastructure Engineering and CE450 Construction Management for civil engineering and ME350 Introduction to Thermal Systems with Army Applications and ME450 ME Design of Army Systems for mechanical engineering.

The Civil Engineering Major

Civil engineers are engaged in the planning, analysis, design, construction, and maintenance of a wide variety of structures and facilities, including buildings, bridges, highways, railroads, airports, dams, canals, ports, water and wastewater treatment systems, and stormwater and sanitary sewer systems. Civil engineers work for private firms and public agencies, teach at universities, and conduct research in laboratories. Within the Army, civil engineering is considered so important that a separate branch, the Corps of Engineers, exists to provide the needed technical expertise. As leaders in the US Army, graduates who major in civil engineering:

1. Solve complex, multi-disciplinary problems effectively, to include:
   - Recognizing and fully defining the physical, technological, social, political, and economic aspects of a complex problem.
   - Using a methodical process to solve the problem.
   - Demonstrating creativity in the formulation of alternative solutions.
   - Using appropriate techniques and tools to enhance the problem-solving process.
   - Working effectively on teams.
   - Developing high-quality solutions that consider the technological, social, political, economic, and ethical dimensions of the problem.
2. Provide appropriate civil engineering expertise to the U.S. Army, when called upon to do so.
3. Communicate effectively.
4. Continue to grow intellectually and professionally —as Army officers and as engineers.

The Civil Engineering major includes mandatory courses in structural analysis and design, hydrology and hydraulic engineering, civil engineering site design, infrastructure engineering, geotechnical engineering, construction management and civil engineering professional practice. The program focuses on building its graduates a broad-based foundation in civil engineering skills that allows them to understand the built environment. The program culminates with a capstone design course, in which cadet teams develop comprehensive designs to meet the requirements of building systems, the building site, foundation systems, drainage systems, and other constraints imposed by the site and local and regional considerations. In addition, many cadets take on an independent-study project that features a real-world, client-based civil engineering project, involving research, community service, or competition between cadet teams. Through this experience, cadets apply and synthesize knowledge gained from earlier civil engineering course work. Design is emphasized throughout the program, as is the use of the computer as a tool for analysis.

The Civil Engineering program serves as excellent preparation for initial Army troop assignments in combat and construction engineering, as well as subsequent assignments in civil works and facilities engineering. The program also provides a sound basis for graduate schooling in civil engineering and related fields, and for registration as a professional engineer. Cadets who maintain good standing in the ABET-accredited civil engineering major will sit for the Fundamentals of Engineering (FE) examination during the spring semester of the senior year. Passing the FE examination is the essential first step in becoming a registered professional engineer.

The Mechanical Engineering Major

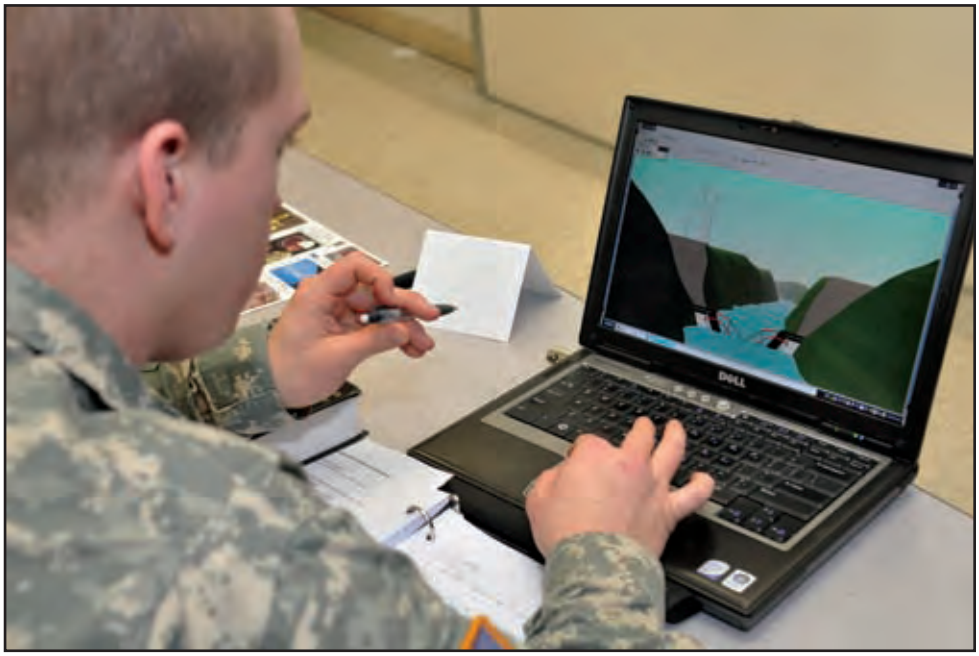
Mechanical engineering is one of the broadest and most diverse of the engineering fields. It deals with devices and systems for energy conversion, for material transport and for control of motion and forces. A sampling of the topics addressed by the discipline include air, ground and sea vehicles; power plants; control systems; machinery; machine tools; conventional and nuclear-powered power production facilities; biomedical devices; space vehicles; pollution control; new energy sources; energy conversion; transportation systems; and military weapons systems. Modern Army systems are used as vehicles of instruction in many of the courses, making mechanical engineering particularly appropriate for those considering service in most branches of the Army as well as specialties such as aviation, research and development, project management, and logistics.

Six options are available within the major: aeronautical systems, automotive systems, biomechanical systems, power and energy, engineering management, and mechatronics. A cadet selecting a particular option will focus program electives to gain greater depth of knowledge in the area of interest. All cadets, regardless of option, experience the same core mechanical engineering program.

The goal of the Mechanical Engineering program is to provide the cadet with high-quality instruction in a positive learning environment that fosters development of critical thinking skills and fundamental understanding of engineering science and design. The graduate is well-prepared to excel as an officer and an engineer and to address complex technical problems in a rapidly changing, high technology Army. The practice-oriented degree is strengthened by the complete integration of design and laboratory experience throughout the curriculum.

Graduates who major in mechanical engineering:

- Demonstrate the philosophical basis for the practice of engineering that applies creative design and engineering thought processes to solve problems.
- Continue to develop an understanding of and appreciation for natural laws and technology, particularly as they apply to mechanical engineering.
- Act responsibly, upholding strict ethical and moral standards and considering impacts of decisions on social, political, economic, and technological issues.
- Demonstrate the necessary leadership and teamwork skills to work in multidisciplinary team environments.
- Demonstrate elements of engineering practice that prepare graduates for advanced study in engineering or other technical areas to include admission into and success at top engineering graduate programs.
- Communicate orally and in writing, using correct and precise terms demonstrating clear, critical thinking.
- Commit to continuous self-improvement and lifelong learning with the flexibility to adapt to changing Army needs.



MC300 Fundamentals of Engineering Mechanics and Design

Both Terms—Prerequisite: MA205 or equivalent. Corequisite: PH202 or equivalent.

The Engineering Design Process and the method of design are introduced. Principles of equilibrium are used to analyze forces on statically determinate rigid bodies and structures to include trusses and frames. The behavior of deformable bodies under axial, flexural, and combined loading is examined. The concepts of stress, strain, and material properties are introduced and are used to relate external forces applied to a body to the resulting internal forces and deformations so that performance can be evaluated. Practical applications involving the design and adequacy of mechanical and structural elements under various loading conditions are emphasized.

3 Credit Hours

MC302 Statics and Dynamics

Second Term—Prerequisite: MA205 or equivalent. Corequisite: PH202 or equivalent.

Statics and Dynamics examines the effect of forces acting on particles and rigid bodies. Vector mechanics is used extensively. The first part of the course, Statics, addresses the topics of equilibrium in two and three dimensions, to include distributed loads, trusses, frames, friction, and cables. The second part, Dynamics, begins with the study of kinematics, including translating and rotating reference frames and Coriolis acceleration. The final block of the course deals with two-dimensional kinetics methods of force-acceleration, work-energy, and impulse-momentum.

3 Credit Hours

CE350 Infrastructure Engineering

Both Terms—Prerequisite: None.

This course identifies, analyzes, and assesses built infrastructure, which is the foundation for modern society. The complex and interconnected nature of infrastructures is investigated and demands on critical components are calculated. Students explore the non-technical factors necessary for the functioning of infrastructure, including supplies, trained personnel, and cross-sector dependencies. The course provides a basis for understanding the complexity and cost of maintaining, rebuilding, and developing infrastructure. Major blocks of instruction include water and wastewater, power, transportation, solid waste, communications systems, and public administration. Several in-class scenarios are provided to synthesize the connectivity between the major items of infrastructure. Finally, as infrastructure is one of the six variables in the joint operating environment, the knowledge gained is employed to analyze infrastructure in the context of combat operations.

3 Credit Hours

MC364 Mechanics of Materials

First Term—Prerequisites: MC300, MA205.

This course studies the behavior of a variety of materials under normal, shear, torsional, bending, and combined loads. The concepts of stress, strain, creep, corrosion, fatigue, and material properties are explored. The course examines observed behavior in light of the relationships between the microscopic structure and macroscopic properties of materials used in engineering applications. The loading, geometry, functional environment, and material properties of machine or structural parts are used to relate the forces applied to a body to the resulting internal forces and deformations so that performance can be evaluated. Practical applications involving the design and adequacy of mechanical and structural elements under various loading and environmental conditions are emphasized.

3.5 Credit Hours

CE371 Soil Mechanics and Foundation Engineering

Second Term—Prerequisite: MC364.

Soil Mechanics is the study of soil properties that govern the use of soil as a construction or foundation material. The course is devoted to describing soils, analyzing soil stresses and seepage, determining consolidation settlement, and designing earth embankments and retaining structures based upon applicable engineering principles and recognition of the fundamental concepts of soil behavior. During the laboratory program, the student will examine soil properties and determine necessary parameters for design.

3.5 Credit Hours

CE380 Hydrology and Hydraulic Design

Second Term—Prerequisites: MC300 or CE302, MA206. Corequisite: MC311.

This course studies both hydrology, which is the study of occurrence, movement and distribution of rainfall, and hydraulic design, which is the application of fluid mechanics and other science and engineering disciplines in the design of structures and development of water resources. Hydrologic principles are applied to model and analyze the distribution and movement of rainfall in a watershed and to analyze and design flow through systems of reservoirs, channels and culverts. The course makes extensive use of computer simulation models used in engineering practice.

3.5 Credit Hours

CE390 Civil Engineering Site Design

First Term—Prerequisite: EV203.

This course provides cadets the necessary background to select and develop sites for civil engineering structures and to review the work of others. Proper site selection and engineering have significant impact on the economics of a project and long-term utility of the constructed facility. Specifically, the course covers the skills of determining site layout and access, establishing site contour and drainage, installing utilities, elementary surveying, creating drawings using a computer-aided drafting package, and developing environmental impact statements. In the theater of operations, this background is critical to the success of missions related to construction of roads, runways, base camps, and other engineered military works.

3.5 Credit Hours

CE399 Civil Engineering Practices - Field Engineering

Summer AIAD—Prerequisites: MC300 and approval of the department head.

This two-phase course includes Operation Civil Engineering Air Force (OpsCEAF) and a three-week field experience at the USAFA Field Engineering and Readiness Laboratory (FERL). The three-week field experience introduces surveying, construction materials, design of concrete mixes, and hands-on construction using metal, timber, asphalt and concrete, and working knowledge of environmental systems. Cadets will construct various projects that they will design in later civil and environmental engineering courses.

3 Credit Hours

CE400 Civil Engineering Professional Practice

Second Term—Corequisite: CE492.

This seminar consists of 13 class attendances during the spring semester and includes all First Class cadets majoring in civil engineering. The course focuses on issues related to the professional practice of civil engineering, and is intended to augment and enrich the cadets' CE492 capstone design experience. Topics include professional roles and responsibilities, professional registration, continuing education, engineering ethics, procurement of work, competitive bidding, quality-based selection processes and construction management. Cadets are also introduced to the design and construction processes used by the US Army Corps of Engineers. The seminar will include presentations by guest lecturers on topics of current interest in the field of civil engineering. Guest lecturers will be primarily civil engineering practitioners, providing the cadets opportunities to interact with professionals in their major fields of interest.

1 Credit Hour

CE403 Structural Analysis

Second Term—Prerequisite: MC364.

This course addresses the analysis and design of basic structural forms, such as beams, trusses, and frames, that are found in bridges and buildings. Classical deflection techniques, such as direct integration and virtual work, and indeterminate analysis techniques, such as the force method and displacement methods (slope deflection, direct stiffness and moment distribution), are used to determine forces and deflections in elastic structures. Structural analysis computer programs are introduced and directly applied in the solution of graded analysis and design problems. Approximate analysis techniques are used to check the general accuracy of computer-based results.

3 Credit Hours

CE404 Design of Steel Structures

First Term—Prerequisite: CE403.

This course teaches the engineering thought process through the design of steel structures. The course synthesizes the fundamentals of statics, mechanics of materials, and structural analysis and applies them to the design of structural members, with emphasis on satisfying real-world needs. Topics include an introduction to the design of structural systems, design of steel tension and compression members, design of beams and beam-columns, and an introduction to connection design. All design is performed in accordance with codes and specifications used in current engineering practice. A comprehensive design problem requires development of a design methodology, consideration of alternative solutions, and design of an optimal steel structure to meet stated functional requirements.

3 Credit Hours

CE450 Construction Management

Both Terms—Prerequisite: CE350.

This course focuses on the implementation portion of the design process. The management of construction is covered to include scope of work, rough order-of-magnitude estimating, scheduling, planning, progress reporting, resource constraining, and quality control. The roles of the contractor, owner, and designer are explained.

3 Credit Hours

CE472 Advanced Soil Mechanics and Foundation Engineering

First Term—Prerequisites: CE371.

Students will extend what they learned in Soil Mechanics and Foundation Engineering and design advanced foundations in this course. Topics covered are: slope stability, field testing, field instrumentation, designing braced excavations, designing piles and drilled shafts, designing flexible walls, designing earth-retaining structures, and designing earth structures using geosynthetics.

3 Credit Hours

MC478 Structural Mechanics

Second Term—Prerequisite: MC364.

The course extends the coverage of Mechanics of Materials to the analysis of elements commonly found in civil and mechanical engineering applications. Topics include stress/strain transformation, Mohr's circle, Generalized Hooke's Law, failure theory, fatigue and fracture mechanics and the basic theory of elasticity in three dimensions. Also covered in varying depth are the numerical methods of finite element analysis, and the experimental methods of electrical resistance strain gages and photoelasticity. Students investigate the combined effects of axial, torsion, flexural, and shear loads on members with complex geometries and cross sections. Coverage includes the generalized flexure theory and shear center, torsion of non-circular cross-sections, and thick-walled cylinders.

3.5 Credit Hours

CE483 Design of Reinforced Concrete and Masonry Structures

First Term—Prerequisite: CE403.

The course introduces the materials and mechanical properties of concrete and masonry, and the design of reinforced concrete and masonry structures. Mix-design, element-casting and strength-testing labs develop the concept of proportioning constituents for quality concrete and provide a background in techniques of material testing, quality control, and sound construction practices. The study of reinforced concrete and masonry includes analysis and design of simple structures, resulting in an appreciation for the strength and serviceability of these structures. Current codes and standards are used to guide the practical design of beams, slabs, columns, footings, walls, and lintels.

3.5 Credit Hours

CE489 Advanced Individual Study in Civil Engineering

Either Term—Prerequisites: First Class standing and permission of the department head.

The cadet, on an individual or small-group basis, pursues advanced study of a research or design topic in civil engineering. The scope of the course is tailored to the needs of the project and desires of the cadet, in consultation with the faculty advisor. The cadet is required to define and analyze the problem, study the fundamentals involved, organize an approach, determine a procedure, perform research and/or achieve a solution, submit a written report, and give a formal briefing.

3 Credit Hours

CE490 Special Topics in Civil Engineering

Either Term—Prerequisite: Permission of the department head.

This course provides in-depth study of a special topic in engineering mechanics or in structural, geotechnical, environmental, water resources, construction, or transportation engineering not offered elsewhere in the West Point curriculum. The course is intended to broaden the cadet's exposure to the civil engineering discipline. Course content will be based on the special expertise of the visiting professor or a senior civil engineering faculty member.

3 Credit Hours

CE491 Advanced Structural Analysis

First Term—Prerequisite: CE403 or equivalent.

This course builds upon the material covered in CE403/453 to develop a better understanding of structural behavior. Matrix analysis methods, including an introduction to finite elements, are developed as the basis for modern, computer-based structural analysis. These and other advanced analytical techniques are used to analyze and design trusses, beams, and frames. Coursework involves extensive use of the computer as an analytical tool. Cadets are introduced to state-of-the-art structural engineering analysis and design software.

3 Credit Hours

CE492 Design of Civil Engineering Systems

Second Term—Prerequisites: CE404 and CE483, and approval of the department head. Corequisites: CE371, MC380.

This course provides an opportunity for cadets to apply and synthesize their knowledge of structural engineering, geotechnical engineering, hydrology, hydraulic engineering, construction management, and engineering economics in an open-ended, realistic, semester-long, capstone design experience. Working in teams, cadets develop functional requirements for a proposed project, then perform the civil engineering designs for this facility. Execution of the design requires extensive use of computer-based analysis and design tools. The products of this effort include writing a comprehensive design report, including drawing a model of the facility, and a briefing to the client. The integrated design experience is augmented by formal classroom instruction in civil engineering systems design and advanced topics in civil engineering component design. This course constitutes the integrative experience for cadets majoring in Civil Engineering and Civil Engineering Studies.

3 Credit Hours

CE495 Transportation Engineering

First Term—Prerequisites: CE371, CE380, and CE390 or equivalent.

This course provides cadets with a solid introduction to the principles of transportation engineering with a focus on highway engineering and traffic analysis. The material learned will provide the basic skill set that will allow students to solve transportation problems that are likely

to appear in professional practice (civilian and military), on the Fundamentals of Engineering exam (FE), and on the Principles and Practice of Engineering exam (PE).

3 Credit Hours

MC306 Dynamics

Either Term—Prerequisites: PH201 or equivalent. Corequisite: MC300.

Dynamics examines the motion of particles, systems of particles, and rigid bodies under the influence of forces. It focuses on the use of Newton's Second Law in three major, progressive blocks of instruction – from scalar, then vector, treatments of rectilinear and curvilinear motion of single particles; through vector motion of systems of particles; to general three-dimensional motion of rigid bodies. The course also provides brief introductions to energy methods: work-energy and impulse-momentum.

3 Credit Hours

MC311 Thermal-Fluid Systems I

Either Term—Prerequisites: MA205 or equivalent, PH201 or equivalent, CH101 or equivalent.

Thermal-Fluid Systems I is an integrated study of fundamental topics in thermodynamics and fluid mechanics. The course introduces conservation principles for mass, energy, and linear momentum as well as the 2nd Law of Thermodynamics. Principles are applied to incompressible flow in pipes and turbomachinery, external flows, power-generation systems, refrigeration cycles, and total air-conditioning focusing on the control volume approach. Laboratory exercises are integrated into classroom work. This course includes completion of a comprehensive, out-of-class design problem. This design problem provides the opportunity for students to apply engineering science and the engineering design process to a hands-on project.

3.5 Credit Hours

MC312 Thermal-Fluid Systems II

Second Term—Prerequisite: MC311.

MC312 Thermal-Fluid Systems II continues the integrated study of fundamental topics in thermodynamics and fluid mechanics. The course applies conservation principles for mass, energy, and linear momentum as well as the 2nd Law of Thermodynamics. Principles are applied to an automotive system to examine engine performance (Otto and Diesel Cycles) and to high performance aircraft to examine the Brayton Cycle, compressible flow, external flow, lift, and drag. Laboratory exercises are integrated into classroom work. Design problems provide the opportunity for students to apply engineering science to the design of thermal-fluid systems.

3 Credit Hours

ME350 Introduction to Thermal Systems with Army Applications

Either Term—Prerequisites: CH102 or CH152, MC300.

This course is presented within the framework of a common model for the engineering design process. This model serves as a conceptual framework for study in the engineering thermal sciences. This course concerns the study of mediums and energy; the basic conservation laws are developed. The student will gain a basic engineering knowledge of thermal science applications in the Army. Emphasis is placed on practical applications of internal combustion and gas turbine engines and fluid flow. Laboratory exercises are integrated into classroom work.

3 Credit Hours

ME370 Computer-Aided Design

Either Term—Prerequisite: MA205 or equivalent.

Explores the use of computer methods as an aid to solving engineering problems. Computer techniques are studied in a variety of engineering contexts. Topics include 3-D solid modeling, engineering analysis, engineering computer programming, and graphical presentation of information. Students learn to apply a variety of engineering-related programs or routines. Students write, document, and use programs of their own in design scenarios. Considerable emphasis is placed on use of the computer as a tool in the engineering design process.

3 Credit Hours

MC380 Engineering Materials

Either Term—Prerequisites: CH102 or CH152 and MC364.

This course explores the relationship between the microscopic structure and macroscopic properties of materials used in engineering applications. The origin of mechanical and physical properties is studied. Emphasized is an understanding of the fundamental aspects of atomic and microstructural concepts for proper materials selection and enhancement of engineering properties. Materials under study are metals, ceramics, polymers, composites, nano-sized/structured materials, biomaterials, smart materials, and semi- and super-conductors. Laboratory exercises are incorporated throughout the course to provide practical experience in making decisions concerning material composition and processing in order to optimize engineering properties. Experiences from the field are detailed to demonstrate application of concepts.

3.5 Credit Hours

ME387 Introduction to Applied Aerodynamics

Second Term—Prerequisites: MC306, MC311. Corequisite: MC312.

The fundamental laws of fluid mechanics are used to develop the characteristic forces and moments generated by the flow about aerodynamic bodies. Lift, drag, and aerodynamic moments are studied

for airfoils (2-D) and finite wings (3-D) in the subsonic and supersonic flow regimes. Aircraft performance and design parameters are developed in both the classroom and laboratory sessions. The laboratory sessions include low-speed wind tunnel testing and actual flight in the Department of Civil and Mechanical Engineering's fixed-wing aircraft located at Stewart International Airport.

3 Credit Hours

ME388 Helicopter Aeronautics

Second Term—Prerequisites: MC300, MC311, ME370.

The aerodynamics of helicopter flight is analyzed for hover, translating, and partial power flight. Theory and experimental results are used to predict aircraft performance. The course analyzes the dynamic response of the rotor system and the performance aspects of the vehicle as a whole. This is followed by a design workshop, during which cadets complete the initial sizing of a helicopter to meet specific mission requirements. The course includes one flight lab in a helicopter, a laboratory examining rotor power and thrust utilizing a whirl stand apparatus, and one field trip to a commercial helicopter company.

3 Credit Hours

ME400 Mechanical Engineering Seminar

Second Term—Prerequisites: ME major, First Class year.

This seminar will meet once each week and will include all First Class cadets majoring in mechanical engineering. Topics will address the concerns of professional mechanical engineers, such as engineering ethics, continuing education, engineering economy, social and safety considerations, and professional registration. Project-management techniques will be introduced in this seminar as well as presentations by guest lecturers on topics of current interest in the field of mechanical engineering. Guest lecturers will be primarily mechanical engineering practitioners, providing cadets an opportunity to interact with professionals in their major field of interest.

1 Credit Hour

ME403 Manufacturing and Machine Component Design

Second Term—Prerequisites: MC300, MC364.

This course is an introduction to mechanical manufacturing machines and machine component design. The first portion of the class is devoted to safe, hands-on experience with manufacturing machines and equipment. Cadets will have the opportunity to work on civil and mechanical manufacturing machines that are common in machine, woodworking, and sheet metal shops such as a mill, lathe, grinder, belt sander, drill press, and band saw. The course progresses to fundamental engineering science applied to machine components. These topics include load, stress, and strain analyses, impact, fatigue, and surface damage. The course progresses to the study of machine component design to include mechanical components such as fasteners, springs, bearings, gears, and shafts. Welding techniques and welding equipment are introduced. The course culminates in a team-oriented process, design, and manufacture of a mechanical engineering product using the techniques, tools, machines, and equipment that were developed and taught throughout the course.

3.5 Credit Hours

ME404 Mechanical Engineering Design

First Term—Prerequisite: ME403.

This course introduces mechanical engineering design as an iterative decision-making process. It also introduces engineering economics and ethics. One engineering design problem reinforces the design process instruction and culminates in a student competition. Cadets begin an integrative capstone design experience that applies the Mechanical Engineering Design Process to a real-world engineering problem addressing social, political, economic, and technical issues. Students begin capstone assignments early in the course and continue their projects with ME496.

3 Credit Hours

ME450 ME Design of Army Systems

Either Term—Prerequisite: ME350.

This course presents mechanical engineering design as an iterative decision-making process. A wide variety of mathematics, science, and engineering fundamentals are applied to the synthesis, analysis, and evaluation of mechanical components. The culminating design project provides an opportunity to experience design and to consider reliability, economics, and the judicious use of resources. A paper design and design and build projects reinforce the design process instruction. The course culminates in a student competition.

3 Credit Hours

ME472 Energy Conversion Systems

Second term—Prerequisites: EE301, MC312.

An overview and historical evolution of both classical and state-of-the-art energy conversion technology. Advanced analysis of energy conversion hardware, air conditioning and refrigeration as well as fossil fuel combustion processes using concepts of exergy. Major methods of direct energy conversion are covered, including thermoelectricity, photovoltaics, thermionics, magnetohydrodynamics, and fuel cells. The current state of national and world energy is presented,

and alternatives, including renewable energy and a hydrogen economy, are explored with reference to economical, political, environmental, and technological factors.

3 Credit Hours

ME480 Heat Transfer

Either Term—Prerequisites: MC312, MA364.
The three modes of heat transfer – conduction, convection, and radiation – are studied in detail, and applications are made to various engineering systems. The principles of conduction and convection are used to study the mechanisms of heat transfer during boiling, condensation and the design of heat exchangers.

3.5 Credit Hours

ME481 Aircraft Performance and Static Stability

First Term—Prerequisites: MC311, ME387
The course applies the principles developed in Applied Aerodynamics to develop the equations of motion for a rigid aircraft in steady state level flight, maneuvering flight, and during takeoff and landing. These equations are analyzed to determine such performance characteristics as maximum range, endurance, turning rate, climb rate, etc. Piston-prop, turboprop, and jet aircraft are considered. The equations of motion are then analyzed to develop static stability criteria and investigate steady state control characteristics. Two flight laboratories in the department's fixed-wing airplanes provide the opportunity to obtain performance data and analyze the steady state stability and control of an actual aircraft.

3 Credit Hours

MC486 Vibration Engineering

Second Term—Prerequisites: MC306, MA364. Corequisite: MC364.
In this course cadets develop a foundation in the analysis and design of free and forced single- and multi-degree of freedom systems. Applications include modeling, damping, resonance, force transmissibility, vibration absorbers, matrix formulation, and modal analysis. Emphasis is placed on vibrations examples from several engineering fields. Out-of-class design problems provide cadets with the opportunity to apply principles taught in the classroom to realistic problems encountered by practicing engineers. In-class demonstrations supplement the theory development.

3 Credit Hours

ME488 Flight Dynamics and Automatic Flight Control

Prerequisites: MC486, ME481.
The perturbed state equations of motion for an aircraft are developed and the aerodynamic forces and moments determined. Dynamic stability and response characteristics are investigated, and aircraft design requirements considered. The fundamentals of feedback control system analysis and design are introduced, and examples of stability augmentation and automatic flight control systems are presented. One flight laboratory is performed in the Department of Civil and Mechanical Engineering's aircraft based at Stewart International Airport.

3 Credit Hours

ME489 Advanced Study in Mechanical Engineering

Either Term—Prerequisite: Approval of the Mechanical Engineering Program director.
The cadet pursues advanced study of a topic in mechanical engineering on an individual or small group basis, independent of a formal classroom setting. Similar to graduate-level research, the scope of the selected project is tailored to the interests of the cadet based on resources and in consultation with a faculty advisor. To develop research skills, the cadet is integral in all phases of project completion by defining objectives, studying fundamentals and background material, outlining the approach, conducting analysis, and communicating results.

3 Credit Hours

"Some books are to be tasted,
others to be swallowed,
and some few to be chewed
and digested."

Francis Bacon

ME490 Topics in Mechanical Engineering

Either Term—Prerequisite: TBD.
This course provides in-depth study of a special topic in engineering mechanics or mechanical engineering not offered elsewhere in the West Point curriculum. Course content will be based on the special expertise of the visiting professor or a senior mechanical engineering faculty member.

3 Credit Hours

ME491 Mechanical Power Plants

Second Term—Prerequisite: MC311. Corequisite: MC312.
Cadets engage in the analysis, testing, and evaluation of internal combustion engines and their subsystems with a view toward understanding the underlying principles that affect their design. Spark ignition and compression ignition engine systems are studied in detail with laboratory opportunities to relate theory to practice. A series of component design problems is interspersed throughout the course.

3 Credit Hours

ME492 Power Trains and Vehicle Dynamics

First Term—Prerequisites: MC306, MC312.
An introductory course in ground vehicle theory with emphasis on analysis, testing, and evaluation of automotive power trains and dynamic systems to understand the underlying principles affecting vehicle design. Clutches, transmissions (manual and automatic), differentials, wheels and tires, as well as braking, steering, and suspension systems are studied in detail to include their effect on vehicular or other system performance. High-speed, tracked vehicle application of the above systems is also covered. Theory is verified with hands-on experience in the laboratory. Component design problems are interspersed throughout the course.

3 Credit Hours

ME496 Mechanical System Design

Second Term—Prerequisite: ME404.
This course provides experience in the integration of math, science, and engineering principles into a comprehensive engineering design project. Open-ended, client-based design problems emphasize a multidisciplinary approach to total system design, providing multiple paths to a number of feasible and acceptable solutions which meet the stated performance requirements. Design teams are required to develop product specifications, generate alternatives, make practical engineering approximations, perform appropriate analyses to support the technical feasibility of the design, and make decisions leading to an optimal system design. System integration, human factors engineering, computer-aided design, maintainability, and fabrication techniques are addressed. This course provides an integrative experience in support of the overarching academic program goal and is often interdisciplinary in nature.

3.5 Credit Hours

XE472 Dynamic Modeling and Control

Either Term—Prerequisite: EE301 or EE302.
This course covers dynamic modeling and control of linear systems. The course provides an overview of classical control theory as the foundation for control applications in electrical, mechanical, aeronautical, and chemical systems. Topics here include system modeling using Laplace transforms, frequency domain, and state variable methods. Mathematical models are developed for electrical, mechanical, aeronautical, chemical and other physical control systems. Control systems analysis and design techniques are studied within the context of how each system is physically controlled in practice. Laboratory exercises include feedback design and system identification. Computer design exercises include dynamic modeling and control of various engineering systems.

3 Credit Hours

XE475 Mechatronics

Either Term—Prerequisite: XE472.
XE475 is a comprehensive introductory course in the field of mechatronics. Mechatronics is the crossroads in engineering where mechanical engineering, electrical engineering, computer science, and controls engineering meet to create new and exciting real-world systems. Knowledge of mechanical and electrical components, controls theory, and design are integrated to solve actual physical design applications.

3.5 Credit Hours

XE495 Topics: Advanced Technology

Spring Term—Prerequisite: Approval of the department head.
This course is taught by the Class of 1950 Chair of Advanced Technology, a visiting scholar with a distinguished record of academic and professional achievement in the field of engineering, science, and technology. The seminars focus on topical issues that either reflect the chair's area of expertise or are conducted by an expert in the field. Students will apply mathematics, science, and engineering fundamentals to evaluate equipment, processes, and concepts being used in the Army. The course has a final design briefing that is an integrative experence. Admission into course is with permission of the department head.

3 Credit Hours

Virtually all systems, technologies and devices of the future will depend on the hardware, software and information technology principles our department teaches today. We cover the spectrum of the electrical engineering, computer science, and information technology disciplines. These include both computer hardware and software, but especially network system design and integration, photonics and lasers, telecommunications, information assurance, robotics, computing theory, algorithms, software design and construction and their impacts on people, organizations, and societies. Our programs develop intellectual ability, creativity and skills for professional practice. The faculty and staff are dedicated to the professional growth of cadets and each other. The department's

ELECTRICAL ENGINEERING & COMPUTER SCIENCE

Information Technology and Operations Center, Photonics Research Center, and Network Science Center provide unique opportunities for faculty and cadets to investigate the latest concepts and solve problems on the forefront of knowledge and modern battlefield technology. The quality of our scholarship and service is recognized by our peers, both nationally and internationally. Our programs and all our actions reflect core values consistent with the ethics of the military and the engineering and scientific professions. Each academic program has its own emphasis, but all are designed to prepare graduates for their roles as Army officers and national leaders.

The Department of Electrical Engineering and Computer Science offers traditional academic majors in Electrical Engineering (EE), Computer Science (CS), and Information Technology (IT). In addition, the department offers the Electronic and Information Technology Systems (EITS) academic major, with selectable emphases in areas such as remote sensing, robotics, digital networks, information technology, and information assurance.

These four major programs emphasize the application of creative problem-solving processes, coupled with knowledge of the underlying enabling sciences and technologies, to design, build and test solutions that serve humanity and our nation's defense. The programs prepare graduates to respond to the challenges of a modern military that is increasingly dependent on the dynamic technologies of electrical engineering, computer science and information technology.

These four academic majors (EE, CS, IT, EITS) consist of 40 to 44 courses completed over the four years at West Point. These majors consist of 26 core courses integrated with 14 to 18 additional courses in the four respective major programs.

All cadets at West Point complete the same 26 core courses. One of these is IT105 Introduction to Computing and Information Technology, taught by this department. Taken during the first year, IT105 introduces cadets to information technology and to problem-solving based on the computing sciences.

Cadets not in one of the four major programs of this department and not in one of the other engineering programs at West Point complete an additional four core courses. These four courses are IT305 Theory and Practice of Military Information Technology Systems, taught by this department to cadets in the Second Class year in addition to one of seven three-course engineering sequences chosen by cadets at the beginning of the Third Class year. Two of these seven engineering sequences are taught in this department, one in electrical engineering and one in computer science.

Each of our four major programs and two engineering sequences is further described in the following.

The Electrical Engineering Major Program

Electrical engineers play a critical role in the development of advanced technologies for the Army and society of the 21st century. They serve as design engineers, program managers, and industry leaders in the military, government, and commercial sectors. Electrical engineers engage in the planning, analysis, design, construction, and maintenance of the electronic and electrical systems that energize, connect, and control in order to benefit society and the military. They apply the principles of electrical system design to build computer, communication, robotic, optical, power, control, and other electronic systems to serve the needs of humanity.

The Electrical Engineering major program requires completion of 26 core courses and 18 additional courses in electrical engineering, mathematics, and other engineering disciplines. Cadets who pursue the Electrical Engineering major program choose depth in one of six areas: robotics, wireless communications, fiber optic communications, computer architecture, electronics, and information assurance. For breadth, all options include courses in circuit theory, analog and digital electronics, linear systems theory, electromagnetics, introductory computer architecture, power engineering and engineering courses outside the fields of electrical engineering and computer science. The Electrical Engineering major program concludes with a two-semester senior design project during which cadets work in teams to design, build, and test an electrical system by drawing from the four-year curriculum and applying theoretical concepts to solve a real problem. Final design projects have included autonomous aircraft and land vehicles, optical and wireless communication systems, robotic systems, automated control systems, laser display systems, and optical character and pattern recognition systems.

Teamwork, hands-on laboratory and computer exercises, as well as interdisciplinary design projects, are hallmarks of the Electrical Engineering major program. The courses are current and relevant, and laboratory facilities are among the best in the world. Our faculty is unique among Electrical Engineering faculty in that they include leaders of Soldiers, experts in the discipline, and world-class teachers. Our cadets routinely attend national undergraduate conferences and compete in and win engineering design competitions.

The Electrical Engineering major serves as excellent preparation for initial Army troop assignments, as well as subsequent engineering and leadership positions. The program provides a sound basis for graduate schooling and for registration as a professional engineer. Prior to graduation, Electrical Engineering majors take the Fundamentals of Engineering Examination as the first step toward registration as a professional engineer.

The Electrical Engineering major is accredited by the Engineering Accreditation Commission of ABET, Inc., www.abet.org.

In the several years following graduation, alumni of the Electrical Engineering major program:

- Demonstrate the skills and confidence to grow intellectually and professionally in electrical engineering through self-study, continuing education, and other means, including being prepared to pursue any area of the discipline in-depth as desired or required by the Army.
- Apply disciplinary knowledge and skills to

identify and formulate solutions to problems relevant to the Army that can be solved through the application of electrical engineering theory, tools, and techniques.

- Apply an engineering methodology and creativity to problem-solving in the Army, communicate concepts effectively, and integrate information and computer technologies as multipliers for human intellectual ability and the application of military force when appropriate.
- Demonstrate the ability to work as a member of a diverse team and effectively manage team projects, technology, and technologists, particularly in a military environment.
- Effectively employ electrical and electronic systems in the Army, and lead the exploration of new applications, techniques, and doctrine for their use.

Upon graduation, cadets who major in Electrical Engineering can:

- Apply knowledge of mathematics, probability, statistics, physical science, engineering, and computer science to the solution of problems.
- Identify, formulate, and solve electrical engineering problems.
- Apply techniques, simulations, information and computing technology, and disciplinary knowledge in solving engineering problems.
- Design and conduct experiments to collect, analyze, and interpret data with modern engineering tools and techniques.
- Communicate solutions clearly, both orally and in writing.
- Work effectively in diverse teams.
- Apply professional and ethical considerations to engineering problems.
- Incorporate understanding and knowledge of societal, global and other contemporary issues in the development of engineering solutions that meet realistic constraints.
- Demonstrate the ability to learn on their own.

Some cadets in the Electrical Engineering major program choose to enter the Electrical Engineering Honors major program. The Honors major program offers cadets the opportunity for additional depth of study in Electrical Engineering. It is expected that cadets graduating from the Electrical Engineering Honors Major will be among the highest-achieving majors in Electrical Engineering. They will be recognized as "Honors Graduates" of the Department of Electrical Engineering and Computer Science and will have "Electrical Engineering Honors Major" annotated on their official West Point transcript.

In order to qualify for the Electrical Engineering Honors major, cadets will be required to participate in either an undergraduate research experience or report on their engineering design experience. Both of these include writing a research or engineering paper suitable for submission to a conference or engineering design competition.

Cadets in the Electrical Engineering Honors major program must satisfy minimum graduation requirements including a 3.0 grade point average in the core courses and a 3.5 grade point average in the major program courses to graduate in the honors program.

The Computer Science Major Program

Computers and computer technology play a dominant role in shaping the world and the Army of the 21st century. Computer scientists analyze, plan, design, and build computer systems and components. They become systems analysts, software engineers, information systems managers, computer systems consultants and educators. Computer scientists are employed in every aspect of commercial, military and government practice. As the Army and society at large become ever more dependent on computer systems and technology, the role of computer scientists in protecting digital information becomes more critical every day. The Computer Science program gives cadets an opportunity to acquire an in-depth understanding of computer systems and the principles underlying their design, implementation, and security.

The computer science major program provides cadets a thorough foundation in computer science and prepares them with critical thinking skills to pursue lifelong learning. The program requires completion of 26 core courses and 18 additional courses. Foundation courses in computer science are augmented with courses that cover software design, concepts of programming languages, computer organization and architecture, computational theory, operating systems, databases, simulation, networks, and societal impacts. In their senior year, cadets in the computer science major program work in teams on projects such as developing autonomous unmanned ground vehicles, building software to enhance the security of information systems, and supporting Army system development initiatives. Cadets in computer science also choose three electives from topics such as artificial intelligence, computer graphics, and cyber operations. At least one of the choices must be from a group of electives that cover topics in computer networking.

The Computer Science major is accredited by the Computing Accreditation Commission of ABET, Inc., www.abet.org.

In the several years following graduation, alumni of the Computer Science major program will have:

- Initiated and completed tasks that identify aspects of a complex situation that can be enhanced by using computing technology.
- Applied computing knowledge and skills while using an engineering process individually or in diverse teams to develop computing technology applications.
- Used effective communication to explain new computing technology to war fighters in support of current and emerging Army war fighting doctrine.
- Grown professionally through self-study, continuing education and professional development.

Graduating cadets in the Computer Science major program are expected to:

- Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in the design choices.
- Analyze a problem, and identify and define the computing requirements appropriate to its solution.
- Apply design and development principles in the construction of software systems of varying complexity.
- Function effectively on teams to accomplish a common goal.
- Use current techniques, skills, and tools necessary for computing practice.
- Recognize the need for, and engage in, continuing professional development.
- Understand professional, ethical, and social responsibilities expected of a computer scientist and a military officer.
- Communicate with a range of military and nonmilitary audiences.
- Analyze the impact of computing on Army operations, soldiers, units, and society at large, including ethical, legal, political, and security issues.

Some cadets in the Computer Science major program choose to enter the Computer Science Honors major program at the beginning of the spring term of the Second Class year. This requires a 3.0 cumulative grade point average in the core courses at the time of entry.

The Computer Science Honors Program offers cadets the opportunity for additional depth of study in Computer Science. Cadets in the Computer Science Honors Program will be among the academically highest ranking graduates in Computer Science. They will be recognized as Honors graduates of the Department of Electrical Engineering and Computer Science and will have "Bachelor of Science in Computer Science with Honors" annotated on their official West Point transcript.

Successful completion of the Computer Science Honors Program includes a research requirement that is met by both a written report and an oral presentation. The report and presentation

should be of a depth and quality suitable for professional publication.

Cadets in the Computer Science Honors major program must satisfy minimum graduation requirements including a 3.0 grade point average in the core courses and a 3.5 grade point average in the major program courses to graduate in the honors program.

The Information Technology Major Program

The Information Technology (IT) program builds on the West Point Academic Program Goal for Information Technology:

"Graduates understand and apply information technology concepts to acquire, manage, communicate, and defend information, solve problems, and adapt to technological change,"

and on the associated definition of Information Technology given in Educating Future Army Officers for a Changing World:

"Information Technology encompasses the knowledge, skills, processes, and tools by which the state of the physical world is sensed and, along with other knowledge, is disseminated, stored, transformed, processed, analyzed, presented, used to make decisions about actions, and used to initiate and control actions."

Information technologists play a critical role in the specification, design, acquisition, deployment, and management of information technologies for the Army and society. They address the development and evolution of infrastructure and systems for use in organizations. In the Army, information technologists design, install and modify information systems and networks in tactical and strategic environments.

The IT major program provides cadets an opportunity to study information technology in substantially greater depth than is possible in the core courses. The IT major is about integrating information technology solutions with organizational processes to effectively and efficiently meet the information needs of the Armed Forces, businesses, and other organizations while giving firm consideration to human nature. Graduates of the IT major will be able to integrate the hardware designed and built by electrical engineers and the software developed by computer scientists to build, assemble, install, configure and operate an information infrastructure that is responsive to rapidly changing and unexpected user requirements. Building on the core courses in Information Technology required of all cadets, the IT major provides the combination of knowledge and practical, hands-on expertise for planning, selecting, installing, integrating, and maintaining a complete information system.

The primary goal of the IT major is to teach cadets to systematically identify critical information requirements and then design, build, and test complex information systems from hardware and software components to meet individual client and Army organizational needs.

The Information Technology major program is accredited by the Computing Accreditation Commission of ABET, Inc., www.abet.org.

In the several years following graduation, alumni of the Information Technology major program:

- Indentified and exploited opportunities to improve Army operations by applying best practices in information technology.
- Effectively communicated information technology to a range of audiences.
- Grown professionally through self-study, continuing education, and professional development in service to the Army.

Expected outcomes for graduating cadets in the Information Technology major program are to:

- Communicate solutions to problems clearly, both orally and in writing.
- Adhere to the professional and ethical standards of the IT profession.
- Embrace lifetime learning and the recognition to continue learning throughout a career.
- Develop specialized IT skills in a self-selected specialty area.
- Work as individuals and members of a design team that meets desired specifications.
- Identify, document, and analyze information system requirements for a client and then develop information systems that meet those requirements by integrating core information technologies while using current best professional practices.
- Develop and evaluate effective user interaction designs.
- Apply and explain the rational for accepted security practices to optimize information assurance.
- Demonstrate knowledge in the design and implementation of networks.

Some cadets majoring in Information Technology choose to declare entry into the Information Technology (IT) Honors Program at the beginning of the spring term of the Second Class year. The Honors major program offers cadets the opportunity for additional depth of study in Information Technology. It is expected that cadets graduating from the Information Technology Honors Major will be among the highest-achieving majors in Information Technology. They will be recognized as Honors graduates of the Department of Electrical Engineering and Computer Science and will have "Information Technology Honors Major" annotated on their official West Point transcript.

Successful completion of the honors program includes a research requirement consisting of enrollment in an independent study course that will include completion of both a written report and an oral presentation. The report and presentation should be of a depth and quality suitable for professional publication.

Cadets in the Information Technology Honors Major must satisfy minimum graduation requirements including a 3.0 grade point average in the core courses and a 3.5 grade point average in the major program courses to graduate in the honors program.

The EITS Major Program

The Electronic and Information Technology Systems (EITS) major is a 40-course major that offers theoretical and hands-on experience with electrical engineering, computer science, information technology, and other topics of interest to the individual cadet. EITS is a flexible major that gives cadets significant choices in composing programs of study that match their individual interests by selecting courses from throughout the offerings of the department. The EITS major is challenging, but lets cadets choose their challenges. Additionally, the EITS major can be completed with no more than five courses each term, giving the cadet the opportunity to place greater emphasis on other parts of the academic program, the military program or the athletic program.

Cadets majoring in EITS choose a focus area such as Information Assurance, Robotics, Digital Networks, or Software Development. These focus areas are created by selecting one of the augmented 4-course engineering sequences offered by the department and by selecting additional 3-course threads from among more than a dozen offered in areas such as networks, telecommunications, information assurance, robotics, remote sensing, machine intelligence, software development, and more.

The Three-Course Engineering Sequences

Cadets not in one of the four major programs of this department and not in one of the other engineering programs at West Point complete one of seven 3-course engineering sequences chosen by cadets at the beginning of the Third Class year. Two of these seven engineering sequences are taught in this department, one in electrical engineering (EE3CES) and one in computer science (CS3CES).

The Electrical Engineering Three-Course Engineering Sequence

The three-course engineering sequence in electrical engineering is available to all cadets not in one of the engineering major programs to satisfy their 3-course engineering sequence requirement. The primary goal is to provide a meaningful design experience in electrical engineering focused on robotics. The sequence begins with courses in digital computer logic and electrical circuits and concludes with a course surveying military electronic systems, including the design of such a system. The sequence includes EE300 (Fundamentals of Digital Logic), EE350 (Basic Electrical Engineering), and EE450 (Military Electronic Systems).

The Computer Science Three-Course Engineering Sequence

The three-course engineering sequence in computer science is available to all cadets not in one of the

engineering major programs to satisfy their 3-course engineering sequence requirement. The 3-course sequence in computer science provides a focused foundation in software and information systems engineering. This consists of CS300 (Computer Science Fundamentals), CS350 (Database Design and Implementation), and IS450 (Principles of Distributed Application Engineering). The sequence culminates in an integrated, end-to-end team system design and implementation experience, building an effective and adaptable Internet-based information system.

Courses Offered

CS300 Computer Science Fundamentals

Both Terms—Prerequisite: IT105/IT155 or validation.

This is the first course for cadets enrolled in the computer science core engineering sequence. This course presents a thought-provoking introduction to key computer science concepts. Cadets develop their understanding of programming (to include modular design) and problem-solving skills begun in IT105 and build a foundation for further computer science studies by focusing on software, data organization, and other topics.

3 Credit Hours

CS301 Fundamentals of Computer Science

Both Terms—Prerequisites: IT105/IT155 or validation.

This is the first course for cadets enrolled in the computer science major. This course presents a thought-provoking introduction to the key concepts throughout the field. Cadets develop their understanding of programming (to include modular design) and problem-solving skills begun in IT 105, then launch their computer science studies by focusing on software, data organization, and other topics. Exercises in the design and implementation of software systems are required.

3.5 Credit Hours

CS350 Database Design and Implementation

Both Terms—Prerequisites: CS300/CS301 or IT305.

This course addresses the analysis, design and implementation of relational database applications. Implementation techniques and considerations are discussed and practiced extensively. Key concepts include analysis and design using a standardized notation such as the unified modeling language (UML), data model to logical schema conversion techniques, normalization, transaction processing, and client-server architectures.

3 Credit Hours

CS384 Data Structures

Both Terms—Prerequisite: CS301.

This course is designed to build on the cadet's basic programming knowledge. Major emphasis is placed on object-based design, programming methodology, algorithms and algorithm analysis, data structures, and abstract data types as tools for the analysis, design, and implementation of software modules to meet specified requirements. Cadets will learn and employ several well-known algorithms and data structures. Techniques of searching, sorting, recursion, and hashing will be examined. Data structures such as sets, heaps, linked lists, stacks, queues, and trees will be covered. A block-structured programming language reflecting comprehensive support for good software engineering principles will be the foundation of application-oriented exercises. Cadets will design software solutions by employing problem decomposition and selecting the appropriate algorithms and abstract data types.

3 Credit Hours

CS385 Design and Analysis of Algorithms

Second Term—Prerequisites: CS384 and MA372.

This course studies analysis of algorithms and the relevance of analysis to the design of efficient computer programs. Algorithmic approaches covered include greedy, divide and conquer, and dynamic programming. Topics include sorting, searching, graph algorithms, and disjoint set structure.

3 Credit Hours

CS394 Distributed Application Engineering

Second Term—Prerequisite: CS350. Corequisite: CS403. Disqualifier: IS450.

Building on the foundations of algorithm implementation, data structures, data representation, and object-oriented programming, this course focuses on the principles of designing, implementing, and testing a modern distributed application. Cadets study the construction and interaction of user interface, network, web server, database, and other components to produce an integrated working secure system. Cadets learn

new tools and skills working as a team to analyze, design, and implement a system that solves a given problem. This is one of the courses that a Computer Science major can choose from a list of elective courses and the focus is on data structure concepts and object-oriented programming.

3 Credit Hours

CS400 Computer Science Seminar

Second Term—Prerequisite: CS401.
This seminar will meet once each week and will include all first class cadets majoring in computer science. The seminar topics will address the concerns of professional computer scientists and engineers such as the moral, legal, and ethical implications of computers and computer usage. Additionally, this course includes DoD initiatives and their effect on the computer science community.

1 Credit Hour

CS401 Software Systems Design I

First Term—Prerequisite: CS403.
This course is the first in the senior-level sequence dealing with software systems. It provides cadets with an integrative engineering design and implementation experience as they pursue a solution to a complex, real-life problem. Conceptual material stresses requirements definition and problem solving strategies applied to the design and implementation of software systems. Hierarchical abstractions, modeling, and user interface issues are examined and integrated with a study of the software life cycle, requirements specification, and verification and validation issues. Cadets also learn and employ additional advanced computing techniques that prepare them for the more complex portions of project implementations during CS402. Potential topic areas to be covered may include distributed computation, software quality measurement, or portable application interfaces.

3.5 Credit Hours

CS402 Software Systems Design II

Second Term—Prerequisite: CS401.
This course is the second in the senior-level sequence dealing with software systems. Cadet design teams work on client-focused projects. Cadets apply the principles of design and implementation and the issues involved in the production of a significant software-based system. Cadets employ the necessary techniques to assess project progress and quality in the various phases of the software development process. In this manner, they develop a greater depth of understanding of the "analyze, design, build, and test paradigm" required for software engineering projects.

3.5 Credit Hours

CS403 Object-Oriented Concepts

Second Term—Prerequisites: CS384 and CS350.
This course builds on the fundamental programming skills from prerequisite courses to explore advanced concepts used in modern object oriented software design to create software that is robust, reusable, and extensible in varying problem domains. Cadets gain confidence in their abilities to model, implement, and test solutions to demanding programming problems.

3 Credit Hours

CS473 Computer Graphics

Second Term—Prerequisites: CS384, MA205/MA255, and PH203/PH253.
This course concerns computer programs that draw two- and three-dimensional objects on computer output devices and receive input from users through graphical input devices. Cadets implement interactive programs through a commonly available graphical application programmers' interface (API). They learn about graphical hardware devices and the elegant algorithms that underlie the API, including elementary computational geometry, homogeneous transformations, parametric forms, clipping, shading, color, and surface rendering. These concepts are all illustrated with examples of military data visualization, including two-dimensional maps and three-dimensional battle simulation and terrain visualization.

3 Credit Hours

CS474 Fundamentals of Computer Theory

First Term—Prerequisite: CS385.
This course grounds the cadet in the essentials of computational theory: formal languages, automata, and computability. Computation is framed in the context of the Chomsky hierarchy, polynomial and exponential time hierarchies, and decidability hierarchy. It explores fundamental limits on computation: what problems can never be solved, what problems can be solved but are intractable, and the class NP of problems that are thought to be intractable, but for which no proof of intractability exists to date.

3 Credit Hours

CS478 Programming Languages

First Term—Prerequisite: CS403.
Concepts of high-level programming language design are explored in detail. Cadets examine the fundamental issues of programming language design and use this knowledge as a framework for comparison of different high-level languages. Cadets study concepts from some or all of the imperative, functional, object-oriented, concurrent, and logic programming language paradigms.

3 Credit Hours

CS481 Operating Systems

First Term—Prerequisite: CS403.
The operating system controls the computer itself and provides a useful interface for users and application programs. The operating system controls all the computer resources: processors, main storage, secondary storage, I/O devices, and files. It determines which programs will be in memory at any given time and the order in which programs will run. The operating system should resolve conflicts between processes, attempt to optimize the performance of the computer, allow the computer to communicate with other computers, and maintain a record of actions performed as it goes about its system tasks. This course investigates the basic design issues encountered in order to produce an operating system that can address the above problems in an efficient manner. These concepts are reinforced by a series of programming projects that include both design and implementation.

3 Credit Hours

CS482 Cyber Security

Second Term—Prerequisite: CS481 or IT382.
The focus area for this course is cyber security in the context of secure operation of networked computer systems. Topics covered include operating systems, system and network security, and offensive and defensive information operations. A course project and term paper bring together the diverse concepts learned. In a culminating exercise, cadets develop and implement defensive measures to protect a production network from intrusions.

3.5 Credit Hours

CS484 Computer Networks

Both Terms—Prerequisite: CS403 or IT382.
This course provides cadets with an introduction to computer networks by breaking the subject into comprehensible parts and building a survey of the state of the art. The goal of the course is to provide each cadet with basic concepts necessary to understand the design and operation of computer networks. Taking a layered approach, it examines the internet with an emphasis on the TCP/IP protocol suite. Additionally, basic principles including multiplexing, switching, flow control, and error control are covered. Internetworking and its application to both local and wide area networks are also investigated. The course offers an understanding of the current status and future directions of technology and how technology relates to standards.

3 Credit Hour

CS485 Special Topics in Computer Science

Both Terms—Prerequisite: Permission of the department head.
This course provides in-depth study of a special

topic in computer science not offered elsewhere in the USMA curriculum. Course content will be based on the special expertise of the visiting professor or a senior computer science faculty member.

3 Credit Hours

CS486 Artificial Intelligence

First Term—Prerequisites: CS384 and either EE300 or EE360.

The course provides an introduction to the field of Artificial Intelligence (AI). Cadets will develop an appreciation for the domain of AI and an understanding of the current interest and research in the field. The historical ideas and techniques of AI and the resulting set of concepts will be covered. Classic programs will be covered as well as underlying theory. Topics include a history of computer problem solving, heuristic search techniques, knowledge representation, knowledge engineering, predicate calculus, and expert and/or rule based systems. Advanced topics that may be covered include intelligent agents, genetic algorithms, neural networks, fuzzy logic, robotics, vision, natural language processing, learning, and the programming languages of AI. The course will emphasize the practical application of artificial intelligence to industry and business as well as the Department of Defense.

3 Credit Hours

CS488 Language-Based Simulation Modeling

Second Term—Prerequisites: CS403, CS474. Corequisite: CS478.

This course applies nearly all previous study of computer science to a specific problem domain essential to the Army – simulation technology. Cadets will learn the fundamental principles of event-based simulation, language-based representation of simulation models, and how models are implemented efficiently. Finally, they will learn how simulations are assessed and validated to determine their usefulness. A series of progressive implementation projects put learned concepts into practice.

3 Credit Hours

CS489/CS489A Advanced Individual Study in Computer Science

Both Terms—Prerequisite: Permission of department head.

The detailed syllabus of this elective will be tailored to the specific project and to qualifications of the cadet. The research or study program will be proposed by the cadet or selected from those proposed by the department. The cadet will formalize a proposal, design a viable research plan, and conduct research under the guidance and supervision of a faculty advisor. The Head of the Department will approve cadet projects. Lessons and labs will be established by consultation between cadet and advisor.

3 Credit Hours

CS490 Computer Science Summer Research

Summer Term—Prerequisite: Permission of department head.

This course is designed to familiarize the cadet with advanced techniques for independent research in computer science. The course will normally require research, development, and implementation of a novel idea or concept. An oral presentation and a written project report will be completed under the supervision of a USMA faculty member who serves as project advisor. The course requires three full weeks of study, completed in conjunction with the Academic Individual Advanced Development Program. Scope, depth, and material covered will meet the requirements of a three-credit course in computer science.

3 Credit Hours

CS490A Computer Science Summer Research

Summer Term—Prerequisite: Permission of department head.

This course is designed to familiarize the cadet with advanced techniques for independent research in computer science. The course will normally require research, development, and implementation of a novel idea or concept. An oral presentation and a written project report will be completed under the supervision of a USMA faculty member who serves as project advisor. The course requires three full weeks of study, completed in conjunction with the Academic Individual Advanced Development Program. Scope, depth, and material covered will meet the requirements of a three-credit course in computer science.

2 Credit Hours

CS490B Computer Science Summer Research

Summer Term—Prerequisite: Permission of department head.

This course is designed to familiarize the cadet with advanced techniques for independent research in computer science. The course will normally require research, development, and implementation of a novel idea or concept. An oral presentation and a written project report will be completed under the supervision of a USMA faculty member who serves as project advisor. The course requires three full weeks of study, completed in conjunction with the Academic Individual Advanced Development Program. Scope, depth, and material covered will meet the requirements of a three-credit course in computer science.

1 Credit Hour

EE300 Fundamentals of Digital Logic

First Term—Prerequisite: None. Disqualifier: EE360.

This is a course for non-electrical engineering majors that covers the analysis, design, simulation, and construction of digital logic circuits and systems. The material in this course provides the necessary tools to design digital hardware circuits such as clocks and security devices, as well as computer hardware. The course begins with the study of binary and hexadecimal number systems, Boolean algebra, and their application to the design of combinational logic circuits. The first half of the course focuses on combinational logic designs. The second half of the course emphasizes sequential logic circuits like memory systems, counters, and shift registers. Laboratory work reinforces the course material by requiring cadets to design and implement basic digital circuits. Throughout the course, the focus is on how the various digital hardware devices are used to perform the internal operations of a computer.

3 Credit Hours

EE301 Fundamentals of Electrical Engineering

Both Terms—Prerequisites: MA205 and PH202 or equivalents

This first course in electrical engineering for the non-EE engineering major provides a solid foundation in basic circuit theory and analysis, power in circuits and electric power systems, and analog electronics. Lectures, laboratory work, classroom demonstrations and discussions showing practical applications emphasize and illustrate the fundamental theories and concepts presented in the course. Engineering design is reflected in laboratory work and minor design problems.

3.5 Credit Hours

EE302 Introduction to Electrical Engineering

Second Term—Corequisites: MA205 and PH202 or equivalents. Disqualifiers: EE350, EE301.

This first course in electrical engineering provides a solid introduction to electric circuit theory. Fundamental principles and network theorems are developed using DC resistive circuits. The complete responses of RC, RL, and RLC circuits are obtained using classical and Laplace-transform techniques to solve the related differential equations. Electrical system transfer functions, time-domain and frequency-domain relationships, stability, frequency response, steady-state ac analysis, and power are also studied. Laboratory work, practical applications, and classroom demonstrations emphasize and illustrate the fundamentals presented in the course.

3.5 Credit Hours

EE350 Basic Electrical Engineering

Both Terms—Prerequisites: MA205 and PH202 or equivalents.

This is a course for non-electrical engineering majors that provides a foundation in basic circuit theory and analysis, power in circuits and electric power systems, and analog electronics. Lectures, laboratory work, classroom demonstrations and discussions showing practical applications illustrate the fundamental theories and concepts presented in the course. Engineering science is reflected in laboratory work.

3 Credit Hours

EE360 Digital Computer Logic

Both Terms—Prerequisite: IT105 or equivalent. Disqualifier: EE300.

This course covers the analysis, design, simulation, and construction of digital logic circuits and systems. The material in this course provides the necessary tools to design digital hardware circuits such as digital clocks and locks, as well as computer hardware. The course begins with the study of binary and hexadecimal number systems, Boolean algebra, and their application to the design of combinational logic circuits. The first half of the course focuses on designs using small-scale integration (SSI) logic circuits, medium-scale integration (MSI) circuits, and programmable logic devices (PLDs) to implement combinational logic functions. The second half of the course emphasizes sequential logic circuits like counters and sequence recognizers, and also covers memory systems. Laboratory work in this half of the course focuses on using very high speed integrated circuit hardware description language (VHDL) to simulate digital systems and to program those systems into PLDs. As a final project, cadet teams design, build, and test a digital logic system such as a programmable alarm clock, digital lock, or burglar alarm.

3.5 Credit Hours

EE362 Introduction to Electronics

First Term—Prerequisite: EE302.

This course continues cadet education in electrical engineering through the study of basic electronic devices and circuits. It begins with an introduction to the ideal operational amplifier and its applications. It then covers the operation of the pn-junction diode and the bipolar junction transistor (BJT) in DC, large-signal, and small-signal regimes. The course emphasizes single-stage amplifier design. The course concludes with an introduction to field-effect transistors and the design, analysis, simulation, building, and testing of a two-stage audio amplifier. Three laboratory exercises, three mini-labs, a calculator-based equation solving exercise and computer-aided simulations supplement the lectures with practical circuit analysis, design, construction and testing.

3.5 Credit Hours

EE375 Introduction to Computer Architecture

Both Terms—Prerequisite: EE360.

This course provides an introduction to computer organization and computer architecture. It builds on digital logic theory and devices (as studied in EE360) to develop more-complex systems. Emphasis is placed on understanding the basics of computer system organization, design, and operation. This includes the use of Register Transfer Language (RTL) to describe the movement of data in the computer and assembly language programming to control the system at a higher level. Additionally, students are introduced to modern engineering design tools through the use of VHDL (VHSIC Hardware Description Language) as they design, simulate, and program a simple processor in two design projects. Other topics, such as micro-program control, RISC architectures, arithmetic processing, input/output, and memory design, are introduced. Finally, cadets study contemporary PC organization by examining the operation of a program at the register level.

3 Credit Hours

EE377 Electric Power Engineering

Both Terms—Prerequisite: EE301 or EE302.

This course provides a study of the fundamentals in two areas of electric power engineering: electro-mechanical energy conversion and electric power systems. Steady-state behavior in single-phase and balanced three-phase power circuits is emphasized. The concept of per unit analysis is introduced and used throughout the course. Transformers, AC & DC machines, transmission lines, power systems, power electronic devices and renewable energy sources are studied. Laboratory exercises demonstrate the electrical, mechanical, and physical characteristics of several of the systems studied. The cadet will apply analysis, design, build, and/or test techniques to a power related project.

3 Credit Hours

EE381 Signals and Systems

Second Term—Corequisites: EE302, MA206, MA364.

This course provides a general study of linear system theory and signal representation techniques as preparation for continued study in communications, control, and electronic systems. Topics include the resolution of continuous time signals and discrete time sequences into their images as frequency functions using Fourier series and transforms. The study includes singularity functions, convolution, convergence properties, and transform properties. The Laplace transform and its inverse provide a method for determining the system function for systems described by differential equations, while the z-transform and its inverse provide a method of analysis for difference equations. The course includes a brief study of communication system principles to include sampling and a study of analog and digital (both finite and infinite impulse response) filter design. In addition to exposing students to the engineering software program "MATLAB," laboratory periods provided opportunities for instructor-assisted problem solving.

3.5 Credit Hours

EE383 Electromagnetic Fields and Waves

Second Term—Prerequisite: PH202; Corequisite: MA364.

This course is an introduction to electromagnetic fields, which are the foundation of electrical engineering. The course begins with transmission line analysis using circuit models and reviews the mathematical tools (vector algebra and calculus) that are used to describe electromagnetic phenomena. Maxwell's Equations are solved to describe time-harmonic fields under various boundary conditions and at interfaces between dissimilar media. Additional topics include the applications of electromagnetic field theory to transmission lines, antennas, and waveguides, and the role of electromangetics in science, technology and society. Laboratory periods provide opportunities for instructor-assisted problem solving. Additionally, cadets complete a computer project on finding the numerical solutions to Maxwell's equations.

3.5 Credit Hours

EE400 Electrical Engineering Seminar

Second Term—Prerequisite: EE401; Corequisite: EE402.

This seminar will meet each scheduled class hour and will include all first class cadets majoring in electrical engineering. Coursework will predominately be in-class with compensatory time given for out-of-class requirements. The seminar will include Fundamentals of Engineering Exam preparation and review and will address the concerns of professional electrical engineers such as engineering ethics, economics, licensing procedures, design methodologies, reliability, and laboratory safety. Some of the seminar material will be presented by guest lecturers from the military, industrial, and academic communities.

1 Credit Hour

EE401 Electronic System Design I

First Term—Prerequisite: EE362; Corequisite: EE462.

This course is part of a two-semester team design experience in electrical engineering that integrates math, science, and engineering into a comprehensive system. The system design encompasses both analog and digital electronics, and may also include sub-systems. Projects are open-ended and must result in a product that performs within pre-determined or negotiated constraints. The system design problem draws from a variety of science and engineering experiences within the curriculum and requires significant cadet creativity and decision-making. Acceptable solutions must address technological, social, political, economic, and ethical considerations. Classroom instruction addresses design methodologies and common system components. Course requirements include periodic in-progress reviews, written and oral reports.

3.5 Credit Hours

EE402 Electronic System Design II

Second Term—Prerequisite: EE401 and EE462.

This course is part of a two-semester team design experience in electrical engineering that

integrates math, science, and engineering into a comprehensive system. The system design encompasses both analog and digital electronics, and may also include sub-systems. Projects are open-ended and must result in a product that performs within pre-determined or negotiated constraints. The system design problem draws from a variety of science and engineering experiences within the curriculum and requires significant cadet creativity and decision-making. Classroom instruction addresses design methodologies and common system components. Course requirements include periodic in-progress reviews, written and oral reports, and completion of the iterative design, build, and test cycle for a functional system. Factors such as feasibility, reliability, and life cycle costs must be assessed.

3.5 Credit Hours

EE450 Military Electronic Systems

Second Term—Prerequisites: EE302 and EE350.
This is the capstone course of a three course series of courses designed to introduce non-electrical engineering majors to the fundamentals of electrical engineering. These key concepts are then used to interface various sensors and actuators with a simple microprocessor using experiments that demonstrate some basic applications of microprocessor control of a simple robot. Finally, cadets design a robot to autonomously navigate a simple maze that simulates some practical military robotics applications.

3 Credit Hours

EE462 Electronic Design

Second Term—Prerequisites: EE 360 and EE362.
This course focuses on the design, simulation, building, and testing of a wide variety of application-oriented circuits based upon the bipolar junction transistor (BJT) and operational amplifier (OPAMP). Applications of the BJT include current sources, active loads, differential amplifiers, and power amplifiers. OPAMP applications include active filters, oscillators, and comparators. Themes common to both the BJT and OPAMP include frequency response and feedback. The classroom material is supplemented with three labs, three mini-labs, computer-aided simulations using the Cadence suite of software and a comprehensive design project.

3.5 Credit Hours

EE477 Communication Systems

Second Term—Prerequisites: EE362, MA206 and EE381.
This is an introductory course devoted to the fundamentals of analog and digital communication systems used for the transfer of information electronically from one point to another. The course topics will focus on the various methods by which information can be transferred from point to point using analog as well as digital signaling techniques, and analyzing performance in terms of output signal-to-noise ratio or bit error probabilities. The analytical tools mastered in EE302, EE360 and EE381 will be called upon frequently in this course. Software applications, such as MATLAB and MultiSim, will be used for numerical analysis, simulation, and as a display tool in order to aid the learning process. Hands-on exercises and demonstrations will also be used for waveform generation, modulation, demodulation, and time and frequency domain analysis. This will be accomplished using the LabVolt communications training systems, microprocessor/FPGA boards, oscilloscope and spectrum analyzer.

3 Credit Hours

EE478 Digital Communications Networks

Second Term—Prerequisites: EE362 and EE381.
The course examines the most commonly recognized methods used in the design of telecommunications networks. Building on the fundamentals of communications theory, the operational characteristics of existing message-, circuit-, and packet-switched networks are considered. The course progresses to problems and practical considerations involved in the optimum design of communication networks. A firm basis is provided in network topology, traffic representation, and link capacity assignment schemes. Cost and time delay optimization for centralized and distributed networks are investigated. Queuing theory is presented with application to buffer modeling, buffer design considerations, and throughput constraints. Basic network design algorithms, terminal and concentrator connection problems, and flow control schemes are also covered. The course concludes with the study of random access networks and control protocols.

3 Credit Hours

EE482 Wireless Communication System Engineering

First Term—Prerequisite: EE381 and EE383.
This course provides an introduction to wireless systems engineering with applications to voice and data networks. Description of well known systems such as cell phones, pagers, and wireless LAN's is presented along with the design considerations for deployment of wireless networks. Wireless radio channel modeling along with common impairments such as multipath fading are introduced and modulation techniques well suited to the wireless applications are presented. Receivers for the various modulation schemes are analyzed in terms of performance and the trade-offs offered by source and channel coding are presented. Multiple access techniques used in wireless applications are introduced and the design of networks described. The course concludes with an analysis and description of deployed systems along with their standards and services provided.

3 Credit Hours

EE483 Photonics Engineering

Second Term—Corequisites: EE362 and either EE383 or PH382.
This course is an introduction to optoelectronic devices and systems. It begins with a review of the fundamental electromagnetic field theory, quantum mechanics, and solid state electronics that characterize optoelectronic device behavior. The course then addresses essential concepts from geometrical and physical (wave) optics. Building upon these fundamental principles, the course addresses the operating principles and design considerations of photoemitters (lasers and LEDs), photodetectors, optical waveguides and signal modulators. Finally, the cadet incorporates the individual devices in the design, building and testing of a fiber optic data link.

3 Credit Hours

EE484 Advanced Computer Architecture Using VHDL

First Term—Prerequisite: EE375.
The course builds on the computer architecture foundation provided in EE375. The functional block diagram approach and evolution into the Hardware Description Language paradigm, using the DoD Standard, VHDL, introduced in the basic architecture course is expanded to include advanced architectural issues. The Reduced Instruction Set Computer or RISC architecture serves as the basis for the study of advanced issues. Emphasizing Register Transfer Notation and behavioral modeling of discrete system components, hierarchical structural models of representative machines are designed and simulated. Cache memory, virtual memory, instruction pipelining, branch prediction, hazard avoidance and computer arithmetic are the major topics studied. The term project utilizes VHDL for the behavioral description of a processor and then proceeds through the use of CAD synthesis tools and system simulators. The Term Project is used in lieu of a Term End Examination.

3 Credit Hours

EE485 Special Topics in Electrical Engineering: Fiber Optics

First Term—Prerequisite: Permission of senior faculty member or visiting professor.

This course provides an in-depth study of special topics in electrical engineering not offered elsewhere in the USMA curriculum. Course content will be based on expertise of a senior electrical engineering faculty member or a Visiting Professor. The course explores fiber optic technology; understanding fiber optic fundamentals allows students to explore the use of fiber optics in modern telecommunication networks. Topical coverage includes understanding waveguide phenomena such as propagation, single mode vs. multimode regimes, coupling, splicing, attenuation losses, polarization properties, and nonlinear effects.

3 Credit Hours

EE486 Solid State Electronics

Second Term—Prerequisite: EE362.

The course covers device physics, operating principles and applications of diodes, bipolar junction transistors, and field effect transistors (FET). It begins with basic properties of crystalline solids, energy diagrams, and thermal physics. P-N junction diodes are the first semiconducting device explored with further study into MOS capacitor and MOSFET based digital circuits. The course normally covers layout of complementary metal oxide semiconductor (CMOS) gates on an integrated circuit chip. Throughout the course, a number of modern electronic devices are introduced including digital memories, charge coupled devices, solar cells, photodiodes, and light emitting diodes. The laboratories are focused on integrated circuit design and layout, device characterization, and simulation using computer aided design (CAD) tools.

3 Credit Hours

EE487 Designing with Microprocessors

Second Term—Prerequisite: EE375.

This course teaches students how to employ microcontrollers in the design of an embedded system. Cadets first review basic microcontroller organization and system requirements. The detailed study of common microcontroller peripheral devices follows with emphasis on their application to real-time control design. Cadets practice top-down design of both hardware and software components of moderately complex digital systems throughout the semester. Cadets are exposed to addressing, serial and parallel input and output, timing, interrupts, A-to-D and D-to-A conversion, and will develop system software using both assembly and C programming languages.

3 Credit Hours

EE489 and EE489A Advanced Individual Study in Electrical Engineering

Both Terms—Prerequisites: EE362 and permission of department head.

Course requirements will be tailored to the needs and qualifications of the individual cadet. The course will normally involve a project requiring research, experimentation, and the submission of a report under the guidance of a departmental advisor. Alternatively, study may take the form of a tutorial course covering material not available in the regular elective course offerings.

3 Credit Hours

EE490 Electrical Engineering Summer Research

Summer Term—Prerequisites: EE362 and permission of department head.

This course is designed to familiarize the cadet with advanced techniques for independent research in electrical engineering. The course will normally require research, development, and experimental implementation of a novel idea or concept. An oral presentation and a written project report will be completed under the supervision of a USMA faculty member who serves as project advisor. The course requires three full weeks of study, completed in conjunction with the Academic Individual Advanced Development Program. Scope, depth, and material covered will meet the requirements of a three-credit course in electrical engineering.

3 Credit Hours

EE490A Electrical Engineering Summer Research

Summer Term—Prerequisites: EE362 and permission of department head.

This course is designed to familiarize the cadet with advanced techniques for independent research in computer science. The course will normally require research, development, and implementation of a novel idea or concept. An oral presentation and a written project report will be completed under the supervision of a West Point faculty member who serves as project advisor. The course requires three weeks of study, completed in conjunction with the academic individual advanced development program. Scope, depth, and material covered will be equivalent to two credits of course work in electrical engineering.

2 Credit Hours

EE490B Electrical Engineering Summer Research

Summer Term—Prerequisites: EE362 and permission of department head.

This course is designed to familiarize the cadet with advanced techniques for independent research in electrical engineering. The course will normally require research, development, and experimental implementation of a novel idea or concept. An oral presentation and a written project report will be completed under the supervision of a West Point faculty member who serves as project advisor. The course requires three weeks of study, completed in conjunction with the academic individual advanced development program. Scope, depth, and material covered will be equivalent to one credit of course work in electrical engineering.

1 Credit Hour

IS450 Principles of Distributed Application Engineering

Both Terms—Prerequisites: CS300/CS301 and IT305 and CS350. Disqualifier: CS394.

Building on the foundations of algorithm implementation and data representation, this course focuses on the principles of constructing a modern distributed application. Cadets study the principles, construction, and interaction of user interface, network, web server, and database components to produce an effective distributed application. Cadets will learn new tools and skills as a natural part of analyzing, designing, and delivering a system that solves a given problem.

3 Credit Hours

IT105 Introduction to Computing and Information Technology

Both Terms—Prerequisite: None. Disqualifier: IT155.

Designed to meet the needs of the core curriculum, this fundamental course provides an introduction to the principles behind the use, function, and operation of digital computers and information technology. The course presents program design and construction techniques, with consideration given to principles of software engineering. Cadets use a PC-based, integrated program development environment and sophisticated application software. Problem solving using the computer as a tool is a central theme throughout the course as cadets employ a design methodology to solve problems efficiently and logically. Emphasis is placed on learning how to learn and individual discovery. Cadets are introduced to the Internet, and the use of the World Wide Web, other information technology tools, and information security.

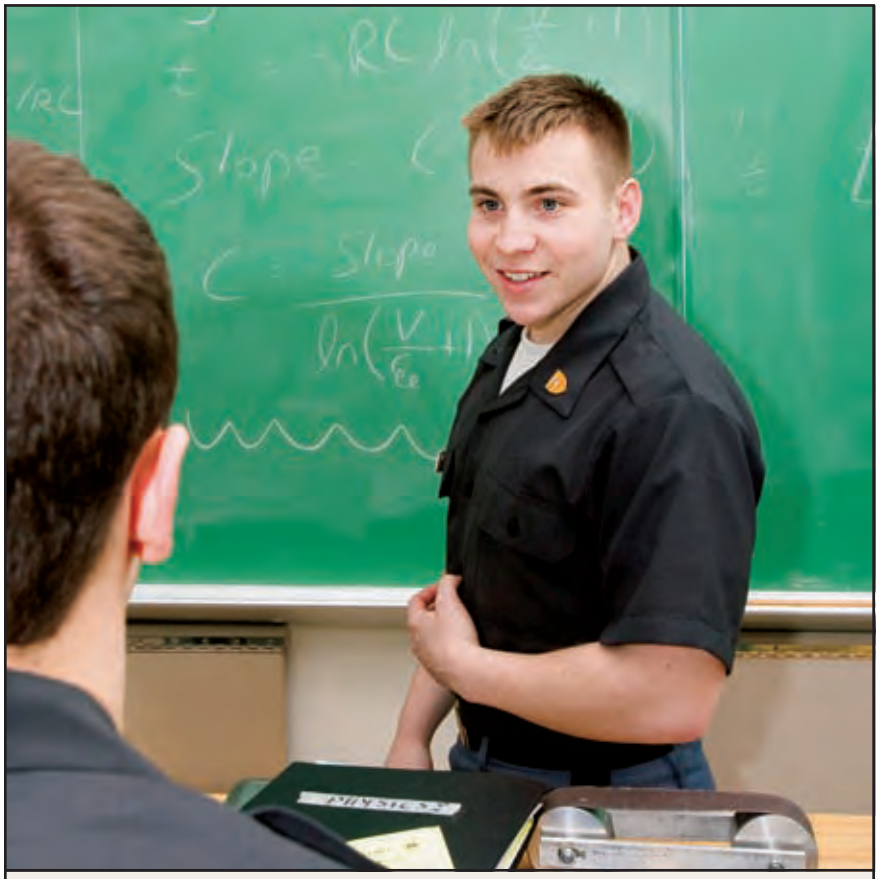
3 Credit Hours

IT155 Advanced Introduction to Computing and Information Technology

Both Terms—Prerequisite: Placement by performance in IT105.

IT155 provides a more-advanced study of computers, information technology and programming for cadets who have demonstrated ability beyond the level of the IT105 course. The course studies advanced microcomputer technology and advanced programming techniques. All graded material is identical to that in IT105.

3 Credit Hours



"What is most needed for learning is a humble mind."

Confucius

IT305 Theory and Practice of Military Information Technology Systems

Both Terms—Prerequisites: IT105/IT155, MA206, PH204/PH254, CH102/CH152, SS202, and EV203.

This course builds on the foundations of IT acquired during the first two years of cadet experiences. It covers web design and implementation, the digitization process, networking, databases, information systems, and information assurance. Cadets also study several aspects of military and commercial information technology (IT) infrastructures, as well as learn the IT concepts and techniques that will facilitate their successes as military officers and inspire lifelong learning in the IT domain. IT305 emphasizes hands-on learning – students complete numerous in-class exercises and labs, as well as team projects.

3 Credit Hours

IT382 Network Infrastructure Management

Both Terms—Prerequisite: IT305.

Cadets study network infrastructures through all stages of implementation and learn the application of networking technology within the Army enterprise. The course integrates fundamental knowledge of network infrastructure by teaching cadets how to design, procure, implement, and maintain both wired and wireless network infrastructures. Cadets learn how to ensure their network is efficient, robust, secure and expandable. This course focuses on the practical study of network infrastructure, but also introduces cadets to the theories behind why existing networks behave as they do.

3 Credit Hours

IT383 User Interface Development

Second Term—Prerequisite: CS300/CS301.

This course provides a practical introduction to user interface development and usability engineering of interactive applications. The disciplines of Human-Computer Interaction (HCI) and Software Engineering guide these endeavors, but the focus here is more applied than theoretical. Major emphasis is on the principles and techniques for human-centered design and implementation of graphical user interfaces (GUIs) within a software-development lifecycle. Cadets will extend their knowledge of programming in a high-level language by learning how to use an interface builder to create a fully functional GUI. Cadets will learn and practice human-centered problem analysis techniques and usability testing methodologies to ensure that their interfaces are usable. A hypothetico-deducto approach to design is emphasized throughout their development efforts. Fundamentals taught in this course will prepare cadets for more advanced software development, development of physical devices, or a deeper theoretical look at HCI topics.

3 Credit Hours

IT384 Network System Programming

Second Term—Prerequisite: CS300.

This course applies fundamental programming skills to automate interactions with a computer, a local operating system, or the Internet and so use and manage resources and services. Examples of the resources and services that the programming in this course will address include file systems, web servers, mail servers, database servers,

image and audio files, compressed and encrypted files, and files used in common office environments (documents, presentations, spreadsheets).

3 Credit Hours

IT392 Network Services Management

Second Term—Prerequisite: IT382.
Cadets study network services in terms of design, implementation, maintenance, and security of computer servers. The learning process in this course builds on IT382 and assumes a functional network with basic connectivity. This course first covers the design and selection of hardware and software to provide network services based on identified user requirements. Cadets then learn to support the Army Enterprise through the implementation and maintenance of network services, including naming, addressing, resource management, voice over IP, and web services. Security is a pervasive theme throughout the course. While this course focuses on the practical aspect of network services, it also gives cadets a foundational understanding of the theories behind those services.

3 Credit Hours

IT400 IT Seminar

Second Term—Corequisite: IT402.
This seminar will meet once each week and will include all First Class cadets majoring in information technology. This course addresses professional practice topics such as the moral, legal, and ethical implications of the discipline and their usage. Topics also address Army and DoD initiatives, as well as new developments in the discipline.

3.5 Credit Hours

IT401 IT System Development I

First Term—Prerequisite: IT major with First Class standing.
This course is the first in the senior-level integrative capstone experience. Its purpose is to prepare cadets for a coherent system integration experience. Conceptual material stresses requirements elicitation including aspects of the social, political, economic and ethical dimensions, project planning, and integration of information technologies to meet the needs of the user organization.

3.5 Credit Hours

IT402 IT System Development II

Second Term—Prerequisite: IT401.
This course is the second in the senior-level integrative capstone experience. Cadets examine, in detail, the principles and issues involved in the integration of a significant information system. Cadet design teams, under the guidance of course instructors and in interdisciplinary groups, work on a client-focused system-integration project that includes the social, political, economic, and ethical dimensions.

3.5 Credit Hours

IT460 Information Warfare

First Term—Prerequisites: IT105/IT155 or validation, and SS307/SS357 or validation.
This course addresses political, legal, and ethical aspects of information warfare and the technology and techniques of cyber attack. The Political Science and Computer Science faculty jointly teach this course. The course covers how digitization has changed the world and the national security environment of the United States. Students also learn how attack and defense are conducted in cyberspace through classroom discussion and hands-on exercises in the IWAR Laboratory. The course culminates with a group project in which cadets are given a real scenario and possible U.S. objectives and then develop and brief an information operation plan.

3 Credit Hours

IT485 Special Topic in Information Technology

Both Terms—Prerequisite: Permission of the department head.
This course provides in-depth study of a special topic in information technology not offered elsewhere in the USMA curriculum. Course content will be based on the special expertise of the visiting professor or a senior information technology faculty member.

3 Credit Hours

IT491/IT492/IT493 IT Independent Study

Both Terms—Prerequisite: Permission of the department head.
This elective will be tailored to the specific project and to qualifications of the cadet. The research, study program, or special project will be proposed by the cadet or selected from those proposed by the department. The cadet will formalize a proposal, develop a viable research plan, and conduct project design under the guidance and supervision of a faculty advisor. The head of the department will approve cadet projects and designate 1, 2, or 3 credits. Lessons and labs established through consultation between cadet and advisor.

1, 2, or 3 Credit Hours

XE402 Interdisciplinary Integrative Experience

First Term—Prerequisites: EE300, EE350, CS300, CS350. Corequisite: EE450 or IS450.
This course gives cadets who are completing the EE or CS three-course engineering sequence the opportunity to participate on senior design project teams in an integrative experience environment. The first half of the course requires analysis of economic, social, political, ethical, and other considerations related to the problem facing the team. During the second half of the course, each analysis is factored into the proposed solution while considering technical tradeoffs. In the case of low enrollment in this course, cadets may act as consultants to more than one project team.

3 Credit Hours

XE472 Dynamic Modeling and Control

Both Terms—Prerequisite: EE362 or EE301.
This course covers dynamic modeling and control of linear systems. The course provides an overview of classical control theory as the foundation for control applications in electrical, mechanical, and aeronautical systems. Topics here include system modeling using Laplace transform, frequency domain, and state variable methods. Mathematical models are developed for electrical, mechanical, aeronautical, chemical and other physical control systems. Control systems analysis and design techniques are studied within the context of how each system is physically controlled in practice. Laboratory exercises include feedback design and system identification. Computer design exercises include dynamic modeling and control of various engineering systems.

3 Credit Hours

XE497 Critical Scientific Reasoning

First Term—Prerequisite: Approval of the department head; open only to First Class cadets.
The purpose of XE497, Critical Scientific Reasoning, is to improve the students' ability to analyze complex problems in a variety of applied physical science applications using mathematical, scientific, and engineering principles and clearly articulate their analysis and results verbally and in writing. The process of pursuing this goal will make cadets better officers, scholars, and citizens. Several methods will be applied to assist in the pursuit of these goals. Fundamental scientific laws, principles, and theorems and their application to scientific and engineering problem solving will be reviewed. Breadth across a variety of scientific and engineering disciplines will be achieved by studying and discussing current research activities from a variety of fields as well as examining the limitations to scientific advancement in each field. The course will draw from several disciplines including Biology, Chemistry, Civil Engineering, Computing Sciences, Electrical Engineering, Mathematical Science, Mechanical Engineering and Physics. In order to take advantage of the diverse skills of the USMA faculty and selected experts from outside West Point, some classes will be led by guest instructors, each of whom will recommend readings in support of his or her topic.

3 Credit Hours

The Department of English and Philosophy contributes to the total education of cadets by teaching them to organize their ideas effectively and express them clearly in writing; to understand the power of imagination and the beauty of language through a study of literature; to reason clearly, through a study of philosophy, about fundamental matters affecting their desire to lead worthy, examined lives; and to appreciate the diverse cultures that constitute America and the world by studying texts that reflect those cultures. In addition to core courses in composition, literature, and philosophy, the Department of English and Philosophy offers a major in Art, Philosophy, and Literature.

ENGLISH & PHILOSOPHY

Studies in Art, Philosophy, and Literature Major

Intellectually curious cadets who shape a program in Art, Philosophy, and Literature deepen their knowledge and appreciation of humanity's ability to reason and create. The field offers cadets unparalleled insights to the human condition through study of the aesthetic creations, worldviews, and imaginative works that mark a wide array of cultures. As manifestations of human behavior, those subjects repay attention with enriched understandings of history and with explanations of why people pursue particular goals. Presenting ethical issues in diverse ways, the field helps cadets in apprehending life's moral complexity and in dealing reasonably with it. Cadets refine their speaking and writing skills and strengthen their respect for the power of language. By completing a major, cadets develop a culturally sensitive global perspective, prepare themselves uniquely for Army service, and promise to contribute immensely to the continued success of the Army.

Standard Courses

EN101 Composition

First Term—Prerequisite: None.

EN101 aims to develop clear, logical, and grammatically correct expression in written discourse. Daily writing and revision reinforce instruction in the writing process. Substance, organization, style, and correctness are major concerns of the course.

3 Credit Hours

EN102 Literature

Both Terms—Corequisite: EN101.

EN102 studies ways in which writers use language imaginatively. Cadets develop the writing techniques of EN101 in responding to assignments on selected works of literature from diverse authors.

3 Credit Hours

EN302 Advanced Composition

Both Terms—Prerequisite: PY201 and standing as a Second Class cadet.

EN302 refines basic writing skills, develops sophisticated techniques of written expression, and establishes a critical editorial sense with respect to the cadet's own composition and the writings of others. Exemplary readings give substance to daily writing, while revision and extensive counseling emphasize the requirement for substance, organization, style, and correctness.

3 Credit Hours

PY201 Philosophy

Both Terms—Prerequisite: EN102.

PY201 helps Third Class cadets develop their capacities to think clearly and critically. It acquaints cadets with various viewpoints on major philosophical issues; assists them in acquiring a facility with the language, arguments, and methods of moral discourse; and gives special attention to the subject of war and morality.

3 Credit Hours

Elective Courses

The Art, Philosophy, and Literature (APL) program offers certain elective courses every academic year. These courses are EP333 Cultural Studies, EP344 Criticism, EP359 Logical Reasoning, EP388 Ancient Philosophy, EP433 Senior Seminar, and EP487/EP488 Senior Thesis I and II. All other electives are offered in alternate years.

EP333 Cultural Studies

First Term—Prerequisite: PY201.

EP333 analyzes a culture through the study of its art, philosophy, and literature. It not only acquaints cadets with a particular period and place but also introduces them to various definitions of culture and to recent themes and debates in cultural studies. The works of theorists as diverse as Matthew Arnold, Walter Benjamin, Raymond Williams, and Laura Mulvey inform this team-taught course's interdisciplinary approach to cultural artifacts as well as its investigation of aesthetics, ideology, and issues of ethnicity, gender, and class. Typical areas of focus include Augustan Rome, Enlightenment France, and Meiji Japan. Cadets should take this course early in their programs of study.

3 Credit Hours

EP341 British Literature I

First Term—Prerequisite: PY201.

This course is an introduction to the study of British literature, ranging from the Anglo-Saxon

period through the 18th century. Cadets will encounter representative masterworks from the Old English, Medieval, Renaissance, and Neoclassical periods, exploring in the process the development of literary forms, the culture of the British Isles, and the English language itself. Possible areas of emphasis include narrative and lyric poetry from all these periods, drama from the Middle Ages and Renaissance, the periodical essay from the Neoclassical period, and the emergence of the novel as a distinct form of literature in the 18th century.

3 Credit Hours

EP342 Film and Film Theory

Second Term—Prerequisite: PY201.
EP342 examines film as the major new art form of the 20th century. Screenings of important films and readings in film theory introduce cadets to the origins, evolution, and cultural influence of cinema. Cadets explore connections between film and the other arts as well as the relationship between art and technology. Topics may include the Hollywood studio system, the transition to sound, world cinema, auteur theory, screenwriting, censorship, and propaganda.

3 Credit Hours

EP343 American Literature I

First Term—Prerequisite: PY201.
The course will focus on the development of American literature from early contact to the Civil War. Cadets will read from works by such authors as the Puritans, Jefferson, Lincoln, the Transcendentalists, Emerson, Dickinson, Whitman, and Melville as well as literature outside the New England canon: for example, works by Native Americans, French and Spanish colonizers, and African captives. All works will be considered in the context of cultural and intellectual history. EP343 considers a broad range of genres and modes of writing, including (but not limited to) colonial theory, ethnography, autobiography, fiction, essays, and poetry. A central concern of the course will be the question of what constitutes American literature.

3 Credit Hours

EP344 Criticism

Second Term—Corequisite: PY201.
EP344 introduces cadets to the theory of interpretation and the practice of literary criticism. Through the study of critics ranging from the ancient to the postmodern, cadets investigate mimetic, pragmatic, expressive, and objective schools. They also cultivate their own philosophies of interpretation and apply them to primary texts. Readings may focus on aesthetic, cultural, and ethical dimensions of literature, on the role of the critic, and on the proliferation of competing theories during the latter half of the 20th century.

3 Credit Hours

EP346 British Literature II

Second Term—Prerequisite: PY201.
This course continues the survey initiated in British Literature I by considering major authors and works of the 19th and 20th centuries. Through representative but necessarily selective readings, cadets will trace the development of British literature from the Romantic Period into the Victorian Age and then to the present day. Possible areas of emphasis include poetry of the English Romantics; Victorian poetry and prose, to include the novel; and poetry, short fiction, and drama from the twentieth century. Study will emphasize the relation of the works considered to the cultural history of Great Britain and the British Empire and will attend as well to the wider influence of the British tradition.

3 Credit Hours

EP348 American Literature II

Second Term—Prerequisite: PY201.
EP348 will consider both traditional and nontraditional writings from the Civil War to the present. Cadets will examine post-Civil War literature and the myriad, often contradictory desires – economic, aesthetic, sexual, spiritual, and intellectual – to which it gives expression. The course will provide a framework within which cadets may read the literature in a historical context. As does American Literature I, the course stresses the diversity of experience and poetics that characterizes American literature. In addition, cadets will trace the evolution of important literary movements and philosophical influences as well as the metamorphoses of certain genres over time.

3 Credit Hours

EP351 World Literature

First Term—Prerequisite: PY201.
This course enhances cadets' cultural awareness and refines their disciplinary knowledge and interpretive skills by introducing them to major literary texts from around the globe. As an advanced exercise in comparative study and synthesis, World Literature builds on core courses such as EN302 and foreign language offerings. The prose and poetry of a variety of periods and a range of countries provide contexts for and contrasts to the Anglo-American tradition. In a given semester typical texts could include epics and tragedies of Ancient Greece and Rome, Russian novels, works of medieval Islamic literature, haiku of Japan, Continental European novels of the 19th century, or postmodern fiction of South America. This course familiarizes cadets not only with important literary forms and genres but also with cultural and historical contexts for many of the most pressing issues in our volatile world.

3 Credit Hours

EP359 Logical Reasoning

First Term—Prerequisite: PY201.
This course blends two areas of study that are often kept separate in university courses on logic: informal logic and formal (or symbolic) logic. Informal logic's emphasis is on natural language arguments relatively simple in structure, on rules of valid inference as codified in what is called traditional logic, and on the identification of mistakes in reasoning that make arguments logically weak though possibly persuasive (fallacies). Formal logic builds a symbolic representation of sentences and arguments, describes rigorous tests for determining whether symbolized arguments are valid, and provides the means to assess arguments of

far greater complexity than the rules of traditional logic are able to manage.

3 Credit Hours

EP360 Eastern Art

Second Term—Prerequisite: PY201.
Investigating Chinese, Indian, Indonesian, and Japanese folk crafts and architecture, this course intensifies and expands knowledge and understanding of Eastern cultures. To the extent that beautiful and treasured artifacts define and explain a culture, the objects of study provide an important entry to societies marked by languages generally unknown to Western observers.

3 Credit Hours

EP361 Western Art I: Ancient to Medieval

First Term—Prerequisite: PY201.
At the end of the 13th century, Giotto began painting human figures in a way that differed significantly from the vision of his predecessors, and soon sculptors and architects, inspired by classical models, also departed from their received traditions. Although those changes mark a distinctly new era in art, the work of the preceding 4,000 years constitutes a legacy that today brings ever new revelations to its students. Cadets in this course will study some of the great artifacts surviving from those years and seek to understand the various cultural influences that shaped their creation.

3 Credit Hours

EP363 Political Philosophy

First Term—Prerequisite: PY201.
Examining the major theories and problems in the history of political philosophy from Plato to Rawls and emphasizing contemporary theory, this course includes such topics as liberty, equality, political authority, the obligation to obey the state, civil disobedience, anarchism, liberalism, conservatism, democracy, meritocracy, affirmative action, and global politics.

3 Credit Hours

EP365 Ethics of the Military Profession

First Term—Prerequisite: PY201.
The fundamental values and principles of the warrior ethos can be traced back to ancient Greece and Rome. These values provide the moral boundaries of the military profession and distinguish members of this profession from other individuals and groups who employ violence to achieve their ends. Cadets in this course will examine the moral principles that define the Profession of Arms in terms of when the use of force is permissible (or even obligatory) to achieve political objectives and what, if any, limits ought to govern how that force is used.

3 Credit Hours

EP366 Philosophy of Mind

Second Term—Prerequisite: PY201.
This course will jointly address major topics in the traditional philosophy of mind and questions created by recent developments in artificial intelligence: What is mind? What is the relationship of a mind to the physical world, including the brain? What are consciousness and self-consciousness? What are the definitions of mental states and processes, such as perception, desire, belief, emotion, reasoning, and action, and their relationship? Can computers be constructed to think or behave like human beings or to have consciousness? Readings will come from classical sources, such as Descartes, as well as contemporary literature in philosophy, cognitive science, and artificial intelligence.

3 Credit Hours

EP367 Drama

First Term—
Prerequisite: PY201.
EP367 surveys significant plays from a variety of periods and traditions to give cadets an appreciation of a genre that exists as both written literature and creative interpretation. Works to be studied range from the classical tragedies of ancient Greece through the great products of the English Renaissance to modern efforts by British and American playwrights. Although the primary focus rests upon the Anglo-American tradition, the course will not neglect dramatists from other countries and cultures.

3 Credit Hours

EP371 Special Topics in Art History

First Term—Prerequisite: PY201.
This course will provide an in-depth examination of a specific topic in visual culture, closely investigating the way images and monuments engage with and discuss economic, cultural, socio-political, and historical forces. In addition to examining the images and their context, cadets will explore the various ways those objects have been interpreted and understood by historians, artists, and critics. Classroom discussion will be supplemented by trip sections to New York City to see many of the actual images and monuments under investigation. Possible topics might include Modernism/Postmodernism, the History of Photography, and the Visual Culture of War.

3 Credit Hours

EP373 Topics in Ethics

Second Term—Prerequisite: PY201.
This course provides cadets an opportunity for reading and analysis in depth of some of the seminal philosophical works in ethics. Taught in seminar format, the course challenges First Class and Second Class cadets to take responsibility for discussion and analysis and for drawing connections between ideas as they occur throughout history and across cultures. The cadets will gain a deeper understanding of the human condition and of the complex world of values.

3 Credit Hours

EP374 The Arts of War

Second Term—Prerequisite: PY201.
This course ranges widely across cultures and historical periods in studying how human creative imagination has dealt with war. The works in this course are especially illuminating to professional Soldiers.

3 Credit Hours

EP375 Modern Philosophy I

First Term—Prerequisite: PY201.
This colloquium provides cadets an opportunity for reading and analysis in depth of some of the seminal works in modern philosophy. Taught in seminar format, the course challenges first-class and second-class cadets to take responsibility for discussion and analysis and for drawing connections between ideas as they occur throughout history and across cultures. The early focus of the course will be on two schools of European thought, Rationalism and Empiricism, guided the early development of modern Western philosophy. Descartes, Spinoza and Leibniz are recognized as the leading Rationalists. The chief Empiricists include Hobbes, Locke, Berkeley and Hume. The latter part of the course will examine the ideas of Immanuel Kant.

3 Credit Hours

EP376 Modern Philosophy II

Second Term—Prerequisite: PY201.
This colloquium provides cadets an opportunity for reading and analysis in depth of some of the seminal works in modern philosophy. Taught in seminar format, the course challenges first-class and second-class cadets to take responsibility for discussion and analysis and for drawing connections between ideas as they occur throughout history and across cultures. Subjects include: pragmatism, logical positivism, philosophy of language. Philosophers include: Peirce, William James, Frege, Bertrand Russell, the Vienna Circle, Carnap, Quine, G. E. Moore, Wittgenstein, Donald Davidson.

3 Credit Hours

EP380 Eastern Thought

Second Term—Prerequisite: PY201.
This course examines primary sources in its quest for an understanding of the many, often bewildering varieties of Eastern thought. The Analects, the works of Mencius and Chuang Tzu, the Bhagavadgita, Tao Te Ching, and Digha Nikaya, I Ching, Zen writings in Zen Flesh, Zen Bones, The Tale of Genji, Chushingura, Essays in Idleness, The Narrow Road to Oku, and Code of the Samurai-all of those works challenge and enlighten a serious student seeking knowledge about a major part of our planet's population.

3 Credit Hours

EP381 Philosophy of Religion

First Term—Prerequisite: PY201.
EP381 examines the nature and truth claims of religion from the perspective of philosophical analysis. It examines such perennial questions as: Is there a God? What are the arguments for and against the existence of a Supreme Being? How can a good God permit Evil? Is there life after death? Is it rational to believe in God, or does faith stand above or against reason? What is the relationship of religion to ethics? Is the Good good because God commands it, or does God command the Good because it is good?

3 Credit Hours

EP382 Western Art II: Renaissance to Modern

Second Term—Prerequisite: PY201.
Artistic masterpieces proliferated as the West moved into the period now called the Renaissance. As exploration then and later discovered or established other cultures outside Europe, the aesthetic objects of those cultures increased even more the world's inventory of masterpieces. Cadets in EP382 will study selected works from that inventory and gain insight to the artistic process and the astounding cultural education offered by the beautiful creations of a society.

3 Credit Hours

EP383 Reality and Knowledge

First Term—Prerequisite: PY201.
EP383 will address the perennial questions concerning the nature of reality (metaphysics) and what we can know about it (epistemology). How do we acquire knowledge of the physical world? … the nonphysical world? Are there non-corporeal entities (souls, deities, angels)? If so, what can we claim to know about them? How are belief and knowledge related? A systematic and comprehensive approach to these problems and others entails reading works by Plato, Aristotle, Descartes, Locke, Leibniz, Hume, and Kant, as well as more-recent metaphysicians and epistemologists.

3 Credit Hours

EP385 The Novel

First Term—Prerequisite: PY201.
In this course the word "novel" designates any extended fictional narrative, almost always in prose. Cadets study a variety of novels and become better readers and more imaginative interpreters of their culturally complex world.

3 Credit Hours

EP386 Philosophy of Science

Second Term—Prerequisite: PY201.
Mathematics and the sciences (especially the natural sciences) have often been portrayed in the modern era as paradigmatic sources of knowledge. Nevertheless, one can still pose a number of lively and much-debated questions: what makes something a "science?" Is there a single "scientific method" or ideal way of discovering, confirming, or disconfirming scientific truths? Are there limitations to the knowledge the sciences can provide? Indeed, do the sciences provide knowledge? Does science make any presuppositions about the nature of the world or about what exists (ontology)? What is the nature of mathematics? Does it apply to a world of ideal objects, to rules for using symbols, or to the physical world? What kinds of things are numbers? Readings will include works by Peirce, Frege, the Vienna Circle, and Kuhn, as well as contemporary readings in the philosophy of science and mathematics and in the philosophies of physics, biology, the social sciences, and logic.

3 Credit Hours

EP388 Ancient Philosophy

Second Term—Prerequisite: PY201.
The heritage from ancient Greece and Rome provides the foundation for the Western concept of the universe and the place of people in it. This course examines the origins of philosophy, the essentially secular view of man and the world established during the classical period, and major figures whose views continue to shape Western thought.

3 Credit Hours

EP391 Poetry

First Term—Prerequisite: PY201.
Embracing a wide variety of authors, works, periods, traditions, and forms, this course considers the literary genre through which human beings have expressed their most intensely imaginative visions of themselves, the world, and connections between the two. Some consideration of poetics and prosody will complement the cadets' reading of verse that ranges from Japanese haiku through the Shakespearean sonnet to the free-verse creations of modern and contemporary poets.

3 Credit Hours

EP392 Minority Literatures

Second Term—Prerequisite: PY201.
Designed to expand a cadet's view beyond the cultural boundaries of canonical literature, this course examines a diverse collection of texts, ranging from works like Hurston's "Their Eyes Were Watching God," Momaday's "The Ancient Child," and Allende's "The House of Spirits" to works by less-familiar authors like Lu Xun, Naguib Mahfouz, and Oe Kenzaburo.

3 Credit Hours

EP394 Shakespeare

Second Term—Prerequisite: PY201.
EP394 surveys representative Shakespearean plays, including great tragedies, histories, and comedies. Study stresses the nature of Shakespeare's genius and the relation of his works to the cultures of all ages.

3 Credit Hours

EP433 Senior Seminar

First Term—Prerequisite: Standing as a First Class cadet.
This integrative course develops an archetypal concept that crosses disciplinary boundaries and promotes a synthesis of aspects of the core curriculum. It contributes to the overarching goal of helping cadets "to anticipate and respond effectively to the uncertainties of a changing technological, social, political, and economic world." Archetype subjects will incorporate insights from both the sciences and the humanities, with emphasis on manifestations of the archetype in art, philosophy, and literature. The seminar will typically integrate art, technology, and language. Archetypal themes – the organizing element for the course that will change periodically – might be selected from the following possibilities: the warrior, the bridge, the city, the alien, the ship, and the prison.

3 Credit Hours

EP487 Senior Thesis I

First Term—Prerequisite: Standing as a First Class cadet.
This course permits cadets with the requisite energy and talent to initiate a yearlong project requiring in depth research that culminates in a substantial thesis of high scholarly quality.

3 Credit Hours

EP488 Senior Thesis II

Second Term—Prerequisite: EP487.
This course permits cadets to complete a yearlong project requiring research in depth that culminates in a substantial thesis of high scholarly quality.

3 Credit Hours

The Department of Foreign Languages (DFL) provides the opportunity to develop strong foundations in one or more of eight foreign languages: Arabic, Chinese, French, German, Persian, Portuguese, Russian, and Spanish. These are among the most-commonly spoken languages in the world. Computer-assisted language learning activities are fully integrated into the department's academic program. All of DFL's languages have cadet-led clubs that sponsor extra- and co-curricular events to strengthen cadets' language skills and cultural competencies. DFL also offers two

FOREIGN LANGUAGES

programs to enhance cadets' foreign language skills through language studies and cultural excursions abroad: Academic Individual Advanced Development (AIAD) is a three-week summer immersion program, and the Semester Abroad Program (SAP) affords cadets the opportunity to study at a foreign military academy or civilian university. As participants in these two programs, some 250 cadets per year travel to more than 30 countries, including Argentina, Chile, China, Egypt, France, Germany, Morocco, Russia, Taiwan, and Senegal.

Foreign Languages Major

The study of languages permits access to the minds, to the literature, and to the recorded knowledge of peoples of foreign cultures. Language is the repository of a people's common experience and collective values. Proficiency in foreign languages is a valuable skill for Army officers, of great practical use both professionally and personally. Cadets may study Arabic, Chinese, French, German, Persian, Portuguese, Russian, or Spanish – some of the most important languages of the modern world. They may study a single foreign language or a combination of any two languages.

The primary emphasis in all courses is to develop listening and speaking abilities. Traditional study methods are complemented with technology-mediated learning activities. Advanced-level language study includes courses on the media and military readings, as well as on civilization, culture, and literature.

Requirements for the Single and Double Language Major

The requirements for the single language major in Arabic, Chinese, French, German, Portuguese, Russian, and Spanish include up to eight language courses at the 300 and 400 levels, one course in another Humanities and Social Sciences discipline (Defense and Strategic Studies, English, Geography, History, Law, Social Sciences), and the Language and Culture Capstone Seminar.

Cadets pursuing the double language major are required to take up to seven language courses at the 300 and 400 levels in their primary language and four courses at the 200, 300, or 400 level in their secondary language. In addition, they take one course in another Humanities and Social Sciences discipline (Defense and Strategic Studies, English, Geography, History, Law, Social Sciences) and the Language and Culture Capstone Seminar.

Foreign Area Studies Major

A Foreign Area Studies major is offered to cadets interested in pursuing an interdisciplinary course of study focusing on Africa, East Asia, Eurasia, Europe, Latin America, or the Middle East. Cadets choosing one of these area programs will study the peoples, societies, languages, cultures, geographies, histories, foreign relations, politics, and economics of a particular region. Cadets will have the opportunity to study in-depth the factors that frequently determine national objectives and influence the formulation of governmental policy.

The Foreign Area Studies program is designed to develop cadets' abilities to assess and interpret the relationships and importance – both present and future – of these regions to the United States. This multidimensional academic program requires cadets to synthesize and analyze knowledge from a variety of disciplines. As a result, cadets who select this academic major will gain the intellectual background and personal insights indispensable to effective and rewarding service in the globally committed U.S. Army.

Requirements for the Area Studies Major

In order to major in Foreign Area Studies, cadets are required to complete four language courses at the 300 and/or 400 level. In addition, they take five courses in the Humanities and Social Sciences (Defense and Strategic Studies, English, Geography, History, Law, Social Sciences) and the Language and Culture Capstone seminar.

Foreign Language Courses

Standard (Beginning) Language

LA203-204 Arabic I, II (Standard)
LC203-204 Chinese I, II (Standard)
LF203-204 French I, II (Standard)
LG203-204 German I, II (Standard)
LP203-204 Portuguese I, II (Standard)
LR203-204 Russian I, II (Standard
LS203-204 Spanish I, II (Standard)
LZ203-204 Persian I, II (Standard)

First Term, 203 courses; Second Term, 204 courses—Prerequisite: None.

In the standard course sequence, cadets acquire a basic proficiency in speaking, listening, reading, and writing skills in the foreign language. Learning activities focus on situations cadets are likely to encounter in the target society. Cadets are taught how to express simple ideas and basic needs, comprehend the language in everyday contexts, and read simplified texts and brief, authentic selections. In addition to speaking, listening and reading skills, cadets also learn how to write sentences, paragraphs, and/or short compositions on familiar topics. Through readings and discussions, cadets are introduced to the cultures and history of the language-specific region. Cadets acquire a command of basic vocabulary and gain a general understanding of how the language works, and they become able to apply that knowledge when learning other foreign languages.

7 Credit Hours (3.5 each term)

Elective Courses

Odd-numbered electives are usually first-term courses, while even-numbered courses are generally second-term courses. Several 400-level electives are offered alternate years.

Intermediate Language

LA361-362 Intermediate Arabic I, II
LC361-362 Intermediate Chinese I, II
LF361-362 Intermediate French I, II
LG361-362 Intermediate German I, II
LP361-362 Intermediate Portuguese I, II
LR361-362 Intermediate Russian I, II
LS361-362 Intermediate Spanish I, II
LZ361-362 Intermediate Persian I, II

Prerequisite: The 204 course in the appropriate language or advanced placement.

In the intermediate course sequence, cadets develop proficiency in those skills necessary for communicating effectively in the foreign language and for pursuing upper-level courses. Cadets develop speaking skills that enable them to engage in conversations on a variety of topics with other class members and with native speakers. Cadets reinforce and expand their language skills by reading, viewing, discussing, and writing about contemporary life, current

events, and other cultural and historical topics as presented in selected materials of the language-specific region. In addition, cadets gain an overview of the profession of arms by reading, discussing, and writing about pertinent materials that focus on the mission and history of the military in those countries. Cadets also review the basic rules of grammar and continue to acquire a corpus of vocabulary. This course serves as a bridge to advanced elective language courses.

6 Credit Hours (3 each term)

Linguistics

LN380 The Nature of Modern Languages

Cadets learn that human language is a rule-based and universal system. They examine languages such as those taught at West Point from the perspective of linguists, teachers, and Army officers. Topics include the origin of and the basis for language, the nature of grammar, language sounds, the phenomenon of meaning, and how language attains communication. Knowledge gained is frequently interdisciplinary and relevant to courses offered at West Point in psychology, communication, English, and foreign languages. Graded work may include oral presentations and a term project or paper.

3 Credit Hours

Reading and Writing Through the Media

LA475 Arabic Reading and Writing through the Media

LC475 Chinese Reading and Writing through the Media

LF475 French Reading and Writing through the Media

LG475 German Reading and Writing through the Media

LP475 Portuguese Reading and Writing through the Media

LR475 Russian Reading and Writing through the Media

LS475 Spanish Reading and Writing through the Media

Prerequisite: LX362 (Intermediate) or department permission.

In this course cadets enhance their reading and writing skills through study and discussion of contemporary media (e.g., the internet, television, film, radio, newspapers, and magazines), as well as short literary selections. Reading strategies and textual analysis are addressed. Writing tasks develop organization, substance, and style. Graded work typically includes oral and written summaries of authentic texts and short compositions or reaction papers. The course is conducted in the foreign language.

3 Credit Hours

Military Speaking and Readings

LA476 Military Speaking and Reading in Arabic

LC476 Military Speaking and Reading in Chinese

LF476 Military Speaking and Reading in French

LG476 Military Speaking and Reading in German

LP476 Military Speaking and Reading in Portuguese

LR476 Military Speaking and Reading in Russian

LS476 Military Speaking and Reading in Spanish

Prerequisite: LX475 (Media) or department permission.

Cadets gain an understanding of the profession of arms through lectures and selected reading materials (e.g., journal articles, internet media, training manuals, biographies, and historical documents). Course content may encompass the mission and role, training, operations, tactics, and organization of the armed forces. Oral proficiency is enhanced through in-class discussion as well as role-plays and simulations focusing on scenarios likely to be encountered while an officer is deployed in the target region. Media complement instruction. Graded work may include briefings, role-plays, and simulations. The course is conducted in the foreign language.

3 Credit Hours

Civilization

LA483-484 Arab Civilization I, II

LC483-484 Chinese Civilization I, II

LF483-484 French Civilization I, II

LG483-484 German Civilization I, II

LP482 Civilization of the Portuguese-speaking World

LR483-484 Russian Civilization I, II

LS483 Spanish Civilization and Culture

LS484 Spanish-American Civilization and Culture

Prerequisite: LX475 (Media) or department permission.

Cadets study the culture, history, and geography of a country or region from the beginnings to the present day. Readings, lectures, discussions, and audiovisual materials encompass the civilization's representative artistic and intellectual accomplishments, its present-day political institutions, economy, and popular culture. In addition, the course focuses on values and attitudes, customs and traditions, and social structures.

3 Credit Hours Each

Literature Surveys

LA485-486 Survey of Arabic Literature I, II, III

LC485-486 Survey of Chinese Literature I, II, III

LF485-486 Survey of French Literature I, II

LG485-486 Survey of German Literature I, II

LP492 The Literature of the Portuguese-speaking World

LR485-486 Survey of Russian Literature I, II

LS485 Spanish-American Literature

LS486 The Literature of Spain

Prerequisite: LX475 (Media) or department permission.

Cadets gain basic competence in the knowledge and comprehension of representative literary works and their relationship to the cultural context of the target society from the beginnings to the present day. Selected examples of various literary genres are read, discussed, and analyzed. At the same time, cadets continue to develop greater language proficiency. Video and film presentations supplement readings where possible. Graded work may include oral presentations, short essays, or a term paper. A majority of the work is done in the target language.

3 Credit Hours Each

LA472 Colloquial Arabic

Cadets are introduced to the dialect of a particular Arab country. Oral proficiency gained in this course is complementary to previously learned modern standard Arabic. The course may be taken twice for credit if two different dialects are offered.

3 Credit Hours

LF492 Masterworks of French Literature

Cadets develop competence in the knowledge and comprehension of representative French literary works and their relationship to the cultural context of French society. Selected examples of various literary genres that focus on events pertaining to the two world wars, conflicts in the former French colonies, and other experiences are read, discussed, and analyzed. A majority of the work is done in French.

3 Credit Hours

LG492 Twentieth Century Germany

Cadets develop competence in the knowledge and comprehension of representative German literary works and their relationship to the cultural context of German society. Selected examples of various literary genres that focus on the experiences of the two world wars, a divided nation, and reunification are read, discussed, and analyzed. A majority of the work is done in German.

3 Credit Hours

LP481 Short Story in Portuguese
Cadets gain basic competence in the knowledge and comprehension of representative Brazilian and Portuguese short stories and of their relationship to the cultural contexts of Brazilian and Portuguese society. At the same time, cadets continue to develop greater language proficiency. A majority of the work is done in Portuguese.

3 Credit Hours

LR492 Russian Life in Fiction
Cadets develop competence in the knowledge and comprehension of representative Russian literary works and their relationship to the cultural context of Russian society. Selected examples of various literary genres are read, discussed, and analyzed. At the same time, cadets continue to develop greater language proficiency in the Russian language. A majority of the work is done in Russian.

3 Credit Hours

LS492 20th/21st Century Hispanic Literatures
In this course cadets gain basic competence in the knowledge and comprehension of representative literary works and their relationship to the Hispanic cultural context. Selected examples of various literary genres are read, discussed, and analyzed. At the same time, cadets continue to develop greater language proficiency. Video and film presentations supplement readings where possible. Graded work may include oral presentations, short essays, or a term paper. The work is done in Spanish.

3 Credit Hours

LN400 Language in Context
Cadets travel to selected sites where cultural and linguistic immersion is an opportunity. Cadets engage in structured activities and instruction in the target language. They visit sites of cultural and historical significance and pursue a program of learning approved by the Department of Foreign Languages.

1.5 – 3 Credit Hours

LN482H Spoken Hebrew
Cadets develop entry-level oral proficiency in Hebrew, the ability to read printed Hebrew for all vocabulary covered, and the ability to write sentences in Hebrew. Most of the course work will be oral.

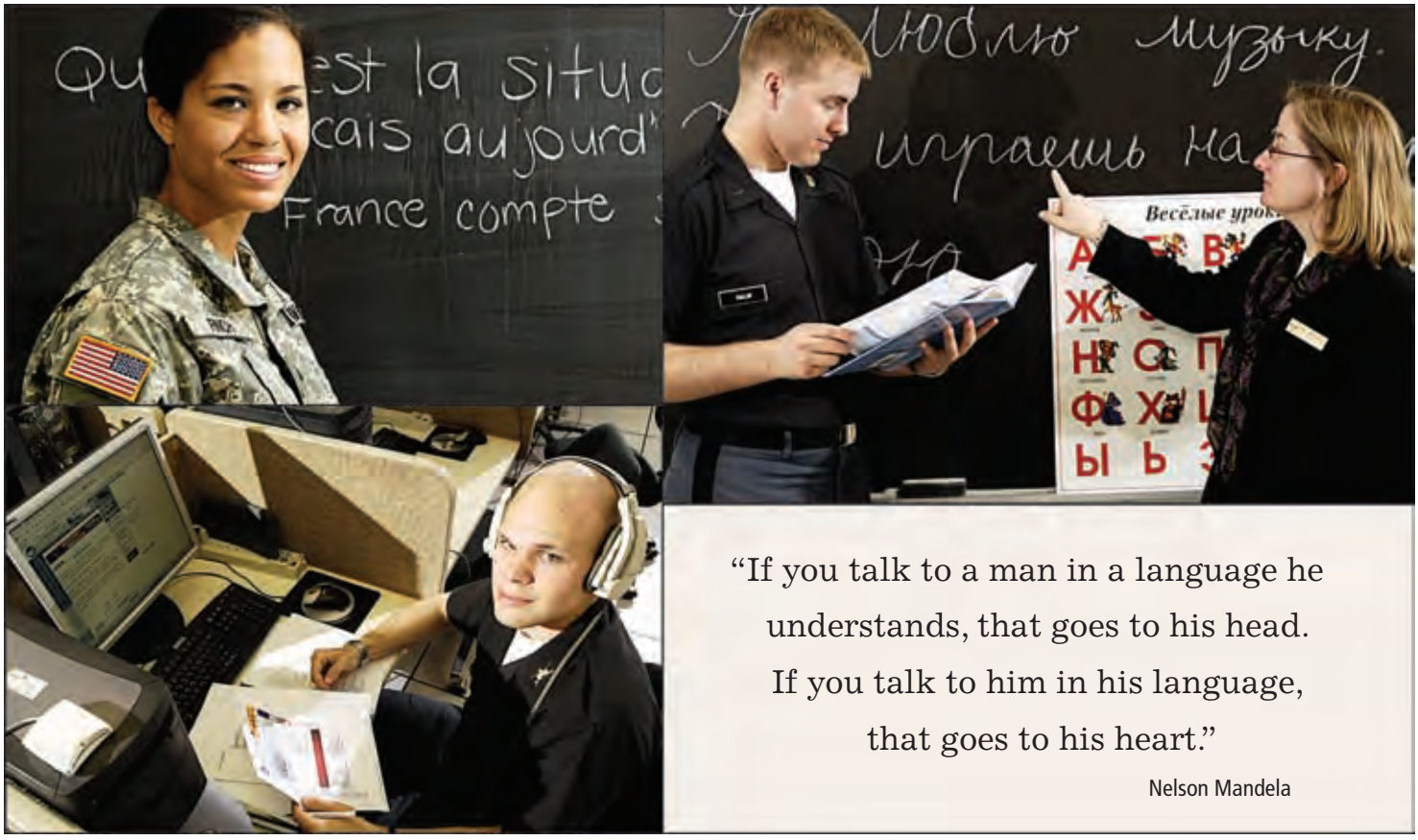
3 Credit Hours

LN487-488 Advanced Individual Study in Foreign Languages
These courses are available only to exceptionally motivated and qualified cadets who have exhausted all other language-specific courses and who wish to pursue a special field of interest in language, linguistics, or a language-related field. The minimum completion requirement is a term paper based on individual research on a topic upon which instructor and cadet have agreed.

3 Credit Hours

LN490 Language and Culture Capstone Seminar
In this capstone course concentrators integrate their knowledge of language and culture with other aspects of the curriculum. They attend lectures, participate in seminar discussions, and complete a project of international import. Cadets develop a regionally focused topic, complete research, and present findings for possible application at the joint command level. They make use of their acquired language skills while completing a course that is interdisciplinary in nature and meets academic program goals.

3 Credit Hours



"If you talk to a man in a language he understands, that goes to his head. If you talk to him in his language, that goes to his heart."

Nelson Mandela

The Department of Geography and Environmental Engineering empowers cadets with an understanding of our Earth, its people, and how they interact. This understanding begins in our core physical geography course, EV203, where cadets learn to apply the basic sciences of the core curriculum to the study of the Earth's surface and atmosphere. Understanding the forces that shape the landscape, how weather and climate impact human activities, and how all these factors affect human endeavors is essential for tomorrow's successful Army officer.

Academic majors offered in the department cover the continuum of disciplines that describe the human interaction with the environment and how we can protect our fragile environment from the harmful impacts of a burgeoning population. Cadets

GEOGRAPHY & ENVIRONMENTAL ENGINEERING

learn to apply the laws of science governing physical and human processes to understand and solve modern problems facing the military and civilian worlds, while sustaining the quality of our environment. Majors include Human Geography, Environmental Geography, Environmental Science, Geospatial Information Science, and the ABET Environmental Engineering major. Additionally, the Environmental Engineering sequence offers an opportunity for cadets interested in the environment to learn about key issues while completing their core engineering sequence requirement.

Tools such as satellite imagery, global positioning systems, and geographic information systems are available in our state-of-the-art Geographic Sciences Laboratory. The department also operates world-class environmental analysis and environmental engineering laboratories.

Majors

The Department of Geography and Environmental Engineering offers majors in both the Humanities and the Social Sciences (HSS), and the Mathematics, Sciences, and Engineering (MSE) disciplines. HSS programs include Human Geography. Environmental Geography bridges the gap between HSS and MSE programs. The department also participates in interdisciplinary programs focused on Foreign Area Studies (East Asia, Eastern Europe, Western Europe, Latin America, or the Middle East). The department's MSE programs include Environmental Science, Environmental Engineering, and Geospatial Information Science. In addition, the department offers an Environmental Engineering core engineering sequence, one of seven such sequences offered by West Point. The goal of the Environmental Engineering sequence is to develop critical-thinking and problem-solving skills through the analysis and solution of complex environmental issues. Cadets develop solutions to environmental problems through the use of mathematics, science, and the application of technology. All of the department's programs of study include technical support from superior undergraduate laboratory facilities for cartography, geology, remote sensing, photogrammetry, environmental analysis, surveying, and geographic information systems. Course work in all majors has direct application to all Army branches and supports future graduate-level studies in geography, in several engineering fields, and in the physical and social sciences.

Human Geography: The Human Geography major focuses on cultural, economic, demographic, and political patterns of human activity. Approaching the study of the Earth as social scientists, human geographers work to understand patterns of human activity and the processes that create them. The major emphasizes an understanding of the Earth's regions and to that end offers seven regional geography courses that provide in-depth, place-based study. Additionally, the program offers courses in urban geography and land-use planning and management, as well as other systematic courses in geography that teach cadets how to look critically at the world and solve problems they will experience in their lifetimes. Because geography is, by nature, an interdisciplinary undertaking, cadets are encouraged to sample from programs outside the field. Human geography is a broad course of study for any cadet interested in international and differential development, culture, globalization, urban or regional planning, or in-depth study of a particular region.

Geospatial Information Science: The United States Department of Labor has identified geospatial information science as one of the top-three growth industries in the United States for the next decade. This is a relatively new discipline that focuses on spatial information, i.e., information that has a location. Location is the main factor used to integrate a very wide range of data for visualization and analysis. As almost all information has a spatial variable, the varieties of information and applications with which the geospatial information scientist is involved are extremely varied. Geospatial information scientists design, develop, and operate systems for collecting and analyzing spatial information about the land, the oceans, natural resources, and the environment. These activities include but are not limited to GPS surveying, digital mapping, geographic information systems (GIS), land information management, land surveying, photogrammetry, and remote sensing.

The Geospatial Information Science curriculum includes specialized courses in surveying, cartography, photogrammetry, remote sensing, advanced remote sensing, geographic information systems, advanced geographic information systems, and military geospatial operations. Cadets are also given the opportunity to select two classes from a broad list of elective courses. No restrictions are placed on the selection of a core engineering sequence. The curriculum culminates with the integration of all forms of geospatial data acquisition and synthesis techniques in an integrative experience focusing on military applications. An honors program in Geospatial Information Science is also offered. Both the civil and military sectors of our society are placing ever-increasing reliance on the ability to build and query geospatial information databases to support a myriad of social/economic and engineering issues. The cadet at West Point has a rare opportunity to pursue an integrated major that other academic institutions commonly spread over several separate disciplines. This major has applicability for the future military officer regardless of branch. The curriculum prepares cadets for advanced civil schooling in any of the specialized fields of geospatial information science.

Environmental Geography: Geography is the study of the variable character of the surface of the Earth as the home of humanity. Environmental Geography is the branch of geography that specifically examines the interactions between people and their environments. Whereas physical geographers focus on the Earth's surface and the atmosphere and human geographers concentrate on the spatial aspect of human activities, environmental geographers are interested in both how people adapt to specific environments and how they alter those environments through their activities. The major consists of both human geography courses and physical geography courses, and is intended for cadets interested in the intersection of humanity and nature. As the world becomes more and more interconnected it is ever more apparent that to understand the holistic system fully, one must dig through multiple layers of phenomena and tie them all together. This is precisely what an environmental geographer does.

Environmental Science: Environmental science is a broad, integrative, science-based discipline that focuses on the interrelationships between people and the environment. Environmental scientists conduct investigations to analyze these interrelationships and to identify, abate, or eliminate human-caused pressures on the environment. The ultimate goal of these investigations is to create a sustainable balance between humans and the natural world that minimizes environmental degradation. This major develops expertise into the processes that sustain our environment by expanding upon the West Point core science education by adding studies in the natural sciences such as biology, ecology, geology, and meteorology, and in the integrative studies of environmental decision making and environmental security. This broad academic background is excellent preparation for challenges faced by a military leader who must balance resource and human requirements. The program seeks to (1) enhance curiosity about natural processes and the ability to study such processes as a scientist and (2) deepen knowledge of human influences on the environment and foster evaluation of our individual and collective responsibilities as environmental stewards.

Environmental Engineering: Environmental engineers face a range of issues from disasters like air pollution from the terrorist attack on the Twin Towers or drinking water contamination following the earthquake in Haiti. Environmental engineers use chemical, biological, and physical processes to engineer systems that address these issues. This discipline is evolving to face new challenges resulting from rapid growth in human population and technology. Environmental engineers work in multinational teams to develop methods to combat global climate change; find alternative sources of energy; and to recover materials from discarded products. It is not surprising that a report in Fortune Magazine identified environmental engineering as the fastest growing profession for the period 2002 to 2012. Our program provides you with an active learning experience designed to develop your knowledge of math, science, and engineering science and your ability to use this knowledge to be an active problem solver for complex environmental issues. This skill has been invaluable to our graduates in the Army as they work environmental projects in Iraq and Afghanistan and improve the welfare of their Soldiers. The objectives of the Environmental Engineering Program identify what our graduates can accomplish after graduation. Graduates of the Environmental Engineering Program can:

- **Analyze and solve complex problems.** Graduates can apply their knowledge of mathematics, science, engineering, and the humanities to analyze and solve practical problems to include those in Environmental Engineering. They can evaluate, mitigate, and communicate risk. They can use appropriate technologies to formulate effective, context-based courses of action; adapt methods and strategies to overcome incomplete or imperfect information; and recommend or choose a best course of action. Graduates can creatively adapt problem solving strategies and solutions to rapidly changing and/or potentially life threatening situations. Problem solving is not bounded by disciplinary expertise. Graduates may encounter problems within the environmental engineering discipline or within the broader context of officership in the profession of arms.
- **Lead, manage, and execute.** Graduates can lead people, manage resources and programs, prioritize activities, and execute projects within constraints to successfully complete the mission within the environmental field and the Army. Graduates must be able to execute an array of missions efficiently while minimizing environmental impacts. Potential missions include actions in combat, homeland security, disaster relief, humanitarian aid, and other operations under austere conditions.
- **Communicate effectively.** Graduates have the ability to listen to, understand, and assess varying viewpoints and can, based on this assessment, communicate pertinent information to stakeholders and the general public in such a manner as to bridge their differences and strengthen relationships among them.
- **Recognize their roles as professionals.** Graduates have internalized their professional responsibilities to society, the profession of arms, and the practice of engineering. They demonstrate internalization through participation in professional societies, continuing education, progression in assignments, community outreach, and other activities.

The Environmental Engineering major is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

Environmental Engineering Sequence: The Environmental Engineering three-course sequence provides cadets with an opportunity to think critically about topical environmental issues and to identify engineering solutions that protect human health and the environment. These issues and their solutions take into account social, political, and economic concerns and are excellent preparation for decision-making in an uncertain world. The Army is a trusted steward of the environment, and cadets who participate in the Environmental Engineering Sequence will gain a better appreciation of the environmental ethos and the importance of safeguarding the health of their Soldiers.

Summary: The strength of the Department of Geography and Environmental Engineering stems from the synergy created by the multidisciplinary expertise of the department faculty. Cadets who choose to major in the department can develop an area of expertise in Human Geography, Environmental Geography, Geospatial Information Science, Environmental Science, or Environmental Engineering, in addition to acquiring a robust foundation in the Humanities, Social Sciences, Mathematics, and Physical Sciences afforded by the West Point core curriculum.

Standard Course

EV203 Physical Geography

Either Term—Prerequisite: MS102.
The course provides the cadet with a basic understanding of the earth/environmental sciences and the necessary knowledge and techniques to conduct a comprehensive terrain analysis at the area or local level using atlases, maps, remotely sensed imagery, and geographic information systems. The cadet initially gains an understanding of the atmosphere, biosphere, earth landforms, and urban environments, and then applies that knowledge in interpreting various maps, atlases, and the different forms of remotely sensed imagery. The acquired knowledge and skills are subsequently used by the student to conduct a comprehensive geographic-area analysis of a selected military operational area. Throughout the course, historical

and contemporary examples are used to examine the effects of weather, climate, and terrain on military operations, and to understand the environmental consequences of human activity.

3 Credit Hours

Elective Courses

EV300 Environmental Science

First Term—Prerequisite: EV203.
As the introductory course to the Environmental Engineering Sequence, EV300 provides the cadet with a broad understanding of current global and local environmental issues. It specifically focuses on natural ecosystems processes, the effects of pollution on human health and how the level of risk associated with this pollution is assessed, the environmental effects of energy use, and air pollution concerns, such as global climate change, acid rain, and smog. Discussions of anthropogenic influences are conducted with consideration of social, economic, technological, and political impacts. Cadets learn to evaluate literature on environmental issues through readings and interactive debates. A course project applying the scientific method to evaluate a current environmental problem provides an opportunity to tie multiple course topics with an in-depth study of an issue of interest.

3 Credit Hours

EV301 Environmental Science for Engineers and Scientists

First Term—Prerequisite: EV203.
This course is similar to EV300 except that the context of discussion in EV301 is appropriate for cadets who have elected to major in science or engineering. EV301 provides the cadet with a broad understanding of current global and local environmental issues. It specifically focuses on natural ecosystems processes, the effects of pollution on human health and how the level of risk associated with this pollution is assessed, the environmental effects of energy use, and air pollution concerns, such as global climate change, acid rain, and smog. Discussions of anthropogenic influences are conducted with consideration of social, economic, technological, and political impacts. Cadets learn to evaluate literature on environmental issues through readings and interactive debates. A course project applying the scientific method to evaluate a current environmental problem provides an opportunity to tie multiple course topics with an in-depth study of an issue of interest.

3 Credit Hours

EV303 Foundations in Geography

First Term—Prerequisite: None.
This course presents the basic concepts, theories, and methods of inquiry in the discipline of geography as foundation for advanced study in Human/Regional Geography, Environmental Geography, or Geospatial Information Science. The course includes models and concepts from the many sub-disciplinary (systematic) areas of geography, including cultural, historical, economic, urban, political, and military geography. The application of concepts to real-world issues is emphasized. Research skills and techniques used by professional geographers are presented. Cadets use these approaches to spatially analyze and map the distribution of human and environmental phenomena. Several short papers will be assigned.

3 Credit Hours

EV350 Environmental Engineering Technologies

Second Term—Prerequisites: EV203, CH102/CH152, MA205, and EV300/EV301.
This course builds on environmental issues introduced in EV300 and further explores environmental engineering from a unit process and materials balance approach. Analyzing water (transport, quality, drinking water treatment, and wastewater treatment), air (transport, quality, and pollutant minimization), and pollutant (solid and hazardous wastes) management, the cadet is exposed to the breadth of the environmental discipline. A laboratory experience is integral to the course. In the laboratory, physical, chemical, and biological quality are discussed and measured. An introductory environmental engineering design project on river water quality is developed within the semester.

3 Credit Hours

EV365 Geography of Global Cultures

Either Term – Prerequisite: EV203.
This course provides the geographic foundation for study in interdisciplinary and management academic areas. Contemporary regions of the world political map serve as the framework within which geographic concepts and analytical techniques are applied. Each cadet will develop an awareness of the diversity and distribution of people on the Earth, human organization and exploitation of territory, and interactions among culture groups. Particular emphasis is placed on social institutions, their impact on economic development, and the subsequent identification and analysis of developed, emerging, and underdeveloped states.

3 Credit Hours

EV371 Geography of Russia

First Term—Prerequisite: EV365.
This course examines the political, economic, and cultural geography of Russia and its adjacent neighbors: the Baltic States, East Central European Region, Transcaucasia, and Central Asia. Topics covered include: the Commonwealth of Independent States, ecocide in the former Soviet Union, disposition of the former Soviet military, and ethnic rivalries. The objective of the course is to provide the cadet with an understanding of the recent past of the traditional Soviet system in order to understand, as well as geographically evaluate, Russia's and the other former republics' situations today.

3 Credit Hours

EV372 Geography of Asia

First Term—Prerequisite: EV365.
The course studies the physical and cultural environment of Asia with emphasis on those geographic elements related to the region's progress, developing nations, and emerging world and regional powers. Topics covered include a consideration of the physical and resource base, environmental and cultural factors, spatial organization of agricultural and industrial economies, population patterns and problems, and examination of the realm's several major subregions.

3 Credit Hours

EV373 Geography of Latin America

First Term—Prerequisite: EV365.
This course studies the physical and cultural landscape of Latin America, giving special treatment to the diversity and cultural identity of the region. Topics covered include a historical geography of the region, including pre-Columbian civilizations, Iberian, African, and European influences; the geography of transportation networks, agriculture, urbanization, and population. National boundaries, major landforms and climatic conditions are discussed to describe their effect on civilization. This course also investigates the historical relationship between the United States and Latin America and covers recent U.S. military interventions in the region.

3 Credit Hours

Geography instructors and IAD cadets in Nicaragua.

EV375 Geography of Africa

First Term—Prerequisite: EV365.
This course examines the cultural and natural diversity of African landscapes, with an emphasis on development, population issues, disease, and the origin, dispersal, spatial organization, and interaction of important cultural groups. Africa's physical landscapes will also be introduced as the palette upon which Africa'scomplex human mosaic has developed. Students will explore, from a geographic perspective, why Africa has seemingly been plagued with problems of economic development, health, and political instability.

3 Credit Hours

EV376 Geography of the Middle East

Second Term—Prerequisite: EV365.
This course examines the cultural and natural diversity of Southwest Asian landscapes. The realm's cultures and ethnicities are studied in a geographic context, with an emphasis on the origin, dispersal, spatial organization, and interaction of important cultural groups. Among issues examined are the distribution and strategic significance of critical mineral and energy resources, population and resource disparities, cultural conflict, and economic development. Students will learn how geographic issues impact the prospects for peace and stability in the region.

3 Credit Hours

EV377 Remote Sensing

Either Term—Prerequisite: EV203.
This course examines the fundamental techniques and significance of the various technologies of remote sensing. Cadets derive meaningful information from a variety of remotely sensed data, including aerial photography, radar, and satellite multi-spectral imagery. Laboratory sessions supplement classroom instruction.

3 Credit Hours

EV378 Cartography

First Term—Prerequisites: EV203 and CS105.
This course applies available mapping and cartographic display techniques as tools for studies in the social/behavioral sciences and engineering fields using the expanding technology of computer graphics. The course makes extensive use of the Geographic Sciences Laboratory.

3 Credit Hours

EV379 Photogrammetry

Second Term—Prerequisites: EV203 and CS105.
EV379 introduces the art and science of obtaining reliable measurements from aerial photography. It

examines the applicability of aerial photography to the military, as well as its utility in several engineering and scientific fields. Laboratory sessions supplement classroom discussions.

3 Credit Hours

EV380 Surveying

First Term—Prerequisite: None.
A framework for understanding and applying practical surveying methods is developed. Consideration of error theory and the concepts of precision of and accuracy yields understanding of the probabilistic nature of measurements. The principles of differential leveling, taping, electronic distance measurement, and angular measurement are studied and applied using state-of-the-art surveying equipment and software tools. Plane surveys are principally explored, although the fundamentals of geodetic surveys are also presented. Traverse, triangulation, trilateration, level networks, and the proper adjustment of related measurements are examined. Control survey, land survey, topographic survey, horizontal and vertical curve design, computer-aided mapping, and GIS applications are included. Extensive use of laboratory periods permits application of surveying fundamentals, methods, and planning skills to actual field situations. The principles of the Global Positioning System are explored, and applications in the Army and surveying are applied in the final lab exercise.

3.5 Credit Hours

EV384 Geography of North America

First Term—Prerequisite: EV365.
This course provides a regional geography of North America, with balanced coverage of the human and physical geography of the United States and Canada. Lectures are appropriately supplemented with movies, slides, and maps to facilitate understanding of important themes that are prevalent in various subregions. Emphasis is placed on cultural patterns and contemporary environmental issues.

3 Credit Hours

EV385 Introduction to Environmental Engineering

Second Term—Prerequisites: CH102/CH152 and MA205/MA255. Corequisite: PH204/PH254.
This course introduces cadets to the study of environmental engineering from a unit process and a materials balance approach. The focus is design-oriented problem solving to protect human health and the health of ecosystems using fundamental physical, chemical, and biological processes. The concept and calculation of risk are introduced as key factors in environmental decision-making. Through the study of contaminant removal from water and air to integrated management techniques for solid/hazardous wastes and ionizing radiation, the cadet is exposed to the breadth of the discipline. In the laboratory, the science behind physical, chemical, and biological processes is applied to the engineering discipline. A military-oriented design problem allows application of engineered solutions to topical water- and air-quality issues.

3.5 Credit Hours

EV386 Geography of Europe

Second Term—Prerequisite: EV365.
This course examines the natural and cultural environment of Europe, focusing on the environmental and cultural diversity exhibited among the various modern states of the continent. West and East European agricultural/industrial resource bases and developmental strategies are

compared and contrasted. Specific topics cover current issues, including geopolitical implications for European security, economic development and trade, and the problems of energy and the environment.

3 Credit Hours

EV387 Meteorology

Second Term—Prerequisite: EV203.
This course provides an introduction to meteorological processes, systems, and patterns with emphasis on spatial distribution and relationships to geographical features. Cadets examine the structure of the atmosphere including the energy budget, heat transfer mechanisms, and daily and seasonal patterns of temperature. They study atmospheric moisture and stability, cloud and precipitation processes, small- and local-scale wind systems, and the general circulation of the planet. Specific phenomena, including mid-latitude cyclones, thunderstorms/lightning, tornadoes, severe thunderstorms, hurricanes, and air pollution, are also covered, including a brief look at climate and climate change. The end of the course focuses on the art and science of weather forecasting and its applicability to military operations.

3 Credit Hours

EV388A Physical Geology

Either Term—Prerequisite: EV203.
This course primarily emphasizes learning to identify minerals and rocks and then applying this knowledge to analyze the significant geologic processes that act on and within the Earth. These processes include plate tectonics, rock mechanics, geologic mapping, ground and surface water, and elements of mining and petroleum engineering. Field trips are conducted to illustrate how local geology has influenced development and construction in the Hudson Valley. The course is capstoned by an open-ended engineering problem that requires the creative application of geology to design a practical solution to a stated need. Cadets use a geologic exploration simulation to convert live resources, optimally including safety and cost factors.

3.5 Credit Hours

EV388B Geomorphology

Second Term—Prerequisite: EV203.
This course studies the processes that create landforms on the surface of the Earth and their regional and global distributions. The course focuses on processes and their interrelationships with geologic structure, soils, and climate. Processes emphasized include glaciers, streams, downslope motion caused by gravity, groundwater, coastlines, and eolian landscapes.

3 Credit Hours

EV389B Climatology

First Term—Prerequisite: EV203.
The course investigates the Earth's atmospheric phenomena, giving special attention to the dynamic physical processes that produce weather and result in distinctive climates. The course focus is on how climate influences daily life and activities. Time is devoted to case studies of urban microclimates and attendant problems of atmospheric pollution and scientific efforts to alter the weather. Exercises allow the student to apply climate data and information to problem-solving in the fields of engineering, agriculture, land use, and the military.

3 Credit Hours

EV390B Urban Geography

Second Term—Prerequisite: EV365.
This course examines the location, function, structure, growth, and interaction of urban areas. Spatial techniques are used to explore the internal attributes of cities, as well as their connectivity to other places. While the primary focus is on urbanization in the United States, primate cities abroad are often used for comparative purposes. Emphasis is placed on contemporary urban problems, particularly environmental issues and social disparities.

3 Credit Hours

EV391A Land-Use Planning and Management

First Term—Prerequisite: EV203.
An introduction to land use planning and management with focus on the land-law interfaces between the physical, cultural, and legal realms. The course surveys the policies and legislative basis for land use controls at the local, federal, and regional levels to include national parks and forests, agricultural lands, rangelands, and military training areas. Natural resource management issues and strategies are explored. The importance of geographic concepts is emphasized in the conduct of applied case studies addressing land use conflicts and environmental strategies.

3 Credit Hours

EV391B Environmental Geology

Second Term—Prerequisite: EV203.
This course focuses on natural phenomena that pose hazards to people. The cause, nature, and occurrence frequency of natural hazards, such as flooding, earthquakes, hurricanes, and volcanic activity, will be examined. Emphasis will also be placed on how people perceive and respond to these hazards. Land-use policies and practices in these hazard areas will also receive attention. Cadets will participate in map-based laboratory exercises and have the opportunity to write a short paper advising a government official how to mitigate local geohazards.

3 Credit Hours

EV394 Hydrogeology/Hydraulic Systems

First Term—Prerequisite: EV203.
This course covers the principles governing the movement of subterranean water (groundwater), the interaction of this water with the porous medium, and the transport of chemical constituents (contaminants) by this flow. Lesson blocks will explore traditional background elements of hydraulic engineering, to include flow systems for the conveyance of groundwater and drainage systems for groundwater and storm water/sanitary sewer system exchange. Simulations will be used to model groundwater flow, contaminant plumes, and other engineering applications. All course material will contribute to modeling a specific situation and developing recommendations for cleaning up contaminated groundwater.

3.5 Credit Hours

EV396 Environmental Biological Systems

Second Term—Prerequisites: EV203, CH102/CH152, and EV300/EV301/EV385.
This course examines biology from a practical environmental engineering and environmental science perspective. The foci of the course are applied public health, microbiology, and microbial energetics. Specific topics include the biological health issues

associated with drinking water, microbial aspects of industrial and domestic waste treatment, and protection or restoration of natural water bodies from environmental contaminants. Students are also introduced to medical geography and the spatial biological health issues associated with a deployment. Laboratory exercises are used to introduce the cadet to water quality analyses and practices commonly used in the fields of environmental engineering and the environmental sciences.

3.5 Credit Hours

EV397 Air Pollution Engineering

Second Term—Prerequisite: EV203.
This course employs a design approach to air pollution control. It begins by defining air pollution problems, including pollutant types, sources, legislation, and effects on both local and global scales. The course then examines the design of various means of controlling particulate and gaseous air pollution from both mobile and stationary sources. Finally, cadets study the link between meteorology and air pollution, as well as pollutant dispersion modeling in the atmosphere. The culminating course project involves a numerical approach to dispersion modeling using IT resources that incorporate modeling and solution optimization.

3 Credit Hours

EV398 Geographic Information Systems

Either Term – Prerequisite: EV203.
The Geographic Information Systems (GIS) course explores, through a hands-on approach, the science behind the map. Cadets learn fundamental geospatial concepts and use professional GIS software to model complex geographic phenomena and solve real-world problems. The course begins by exploring the various geospatial modeling processes, considering the theory behind coordinate systems, and introducing the basics of geovisualization. This is followed by an in-depth look into raster and vector data models. Cadets study various geodata collection techniques, including collecting field data with GPS and survey equipment, integrating and digitizing of remote sensed imagery, and finding and integrating other forms of geodata. Cadets learn various geospatial analysis methodologies, including distance measurements, buffer, overlays, geospatial interpolation, routing, and multi-criteria models. Computer laboratory exercises are used throughout the course to explore and reinforce concepts.

3 Credit Hours

EV400 Environmental Engineering Seminar

Second Term—Corequisite: EV490.
This seminar will meet once each week and will include all First Class cadets majoring in environmental engineering. The seminar topics will address a variety of fundamental engineering science, design, and professional practice topics including engineering ethics, economics, and licensing. Periodically, guest lecturers from the military, industrial, and academic communities will provide their perspectives on these topics.

1 Credit Hour

EV401 Physical and Chemical Treatment

Second Term—Prerequisite: XS391.
This course takes a process approach to environmental engineering using engineering science and design of drinking water treatment systems as the primary foci. Building upon understandings gained from environmental chemistry, cadets will study physical and chemical processes used in environmental engineering. Discussion includes the theories behind these processes and the design procedures involved in their application. The health implications associated with drinking water and water treatment in contingency operations and applicable occupational health issues are discussed during the course. Cadets, working in teams, develop a comprehensive concept design of drinking water treatment processes. While the focus of the course is drinking water treatment, the processes developed are also applicable to wastewater treatment, groundwater remediation, air pollution control, and solid and hazardous wastes treatment.

3.5 Credit Hours

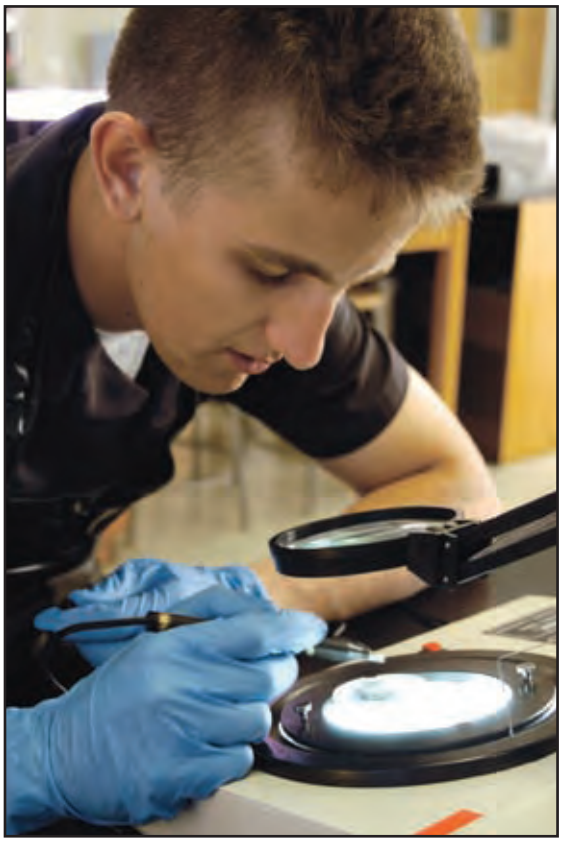
EV402 Biochemical Treatment

Second Term—Prerequisites: ME311 and EV396.
This course provides cadets with the opportunity to apply the principles of microbiology to the protection and improvement of the environment. This course builds on the concepts learned in EV396 Environmental Biological Systems, and directly applies those concepts to the treatment of wastewater, removal of nutrients from wastewater, anaerobic digestion, bioremediation, industrial waste treatment, and emerging applications of biological treatment and modeling. A comprehensive, multi-step design project serves as the design experience for this course.

3.5 Credit Hours

"Military operations are drastically affected by many considerations, one of the most important of which is the geography of the region."

General Dwight David Eisenhower



EV450 Environmental Decision Making

First Term—Prerequisites: EV350 and standing as a First Class cadet.
This course is the third in a three-course sequence and is concerned with the balance of engineered solutions with economic, socio-cultural, political, and ecological considerations evaluated during a decision-making process. Using management of water resources as a teaching model, the realities of decision-making and policy development for all areas of engineering, and particularly environmental engineering, are examined. The course begins with instruction on the tools available to water resource managers, to include both structural (engineered) and non-structural approaches to solve water resource problems. Elements of engineering design and the design process are introduced as well as methods of conducting tradeoff analyses. The course makes use of case studies of current water resource projects and includes a term project. Visiting speakers are employed to present views of government and concerned public interest groups.

3 Credit Hours

EV471 Ecology

Second Term—Prerequisites: EV203 and CH375 or CH385.
This course examines ecosystems through the study of ecological principles related to an organism's relationship to its environment, community, and ecosystem. Species, population, community, and ecosystem level interactions and dynamics are emphasized. The fundamental influences of energy flow and material cycling are examined, as well as the unique role of wetlands within ecosystems. The course includes several field trips, which lead to a culminating term project designed to integrate previously acquired environmental science technical skills and ecological principles.

3 Credit Hours

EV477 Advanced Remote Sensing

Second Term—Prerequisites: EV203 and EV377.
The emphasis of this course is on the processing and analysis of state-of-the-art high spatial and spectral resolution data gathered by airborne and satellite sensors. A wide range of practical exercises and in-class laboratory assignments provides hands-on experience with a variety of remotely sensed imagery ranging from multi-spectral to hyper-spectral data. The course culminates with a capstone term project that allows cadets to apply digital image processing skills to a scientific problem.

3 Credit Hours

EV478 Military Geospatial Operations

Second Term—Prerequisite: EV203.
This course is designed to teach the most current state of geospatial operations in the military. It is built to provide the graduate an improved understanding of the cornerstone to the digital force – the "common operational picture" or "COP." This course is divided into five major blocks of instruction: (1) a linked discussion of geospatial operations' development, organizations and data systems; (2) the geographic information system (GIS) as a military tool – system input, management, data analysis and production outputs; (3) Army geospatial operations in the garrison environment; (4) Army geospatial operations in combat environments; and (5) geospatial operations for joint/coalition forces. The course includes several relevant practical exercises and laboratories, a field trip, guest lectures, and one panel discussion. Due to the currency of the material discussed, a secret security clearance is required for all participants.

3 Credit Hours

EV480 Honors Seminar in Human Geography

First Term—Prerequisites: EV203 and selection for the Honors Program.
This course will examine major research initiatives in the discipline and delineate their data requirements. The primary objective of this course is to identify and outline the senior thesis, which is the culminating event for the Honors Program. Hence, cadets participating in this course will explore research methods and data sources used by geographers, conduct a critical analysis of seminal literature in the field, define a research problem, identify and evaluate data sources, and assemble a research proposal. The final product of this course will be a written research proposal that will define the senior thesis (written during EV489B). The cadet will make a formal presentation of this proposal to senior geography faculty. The course is conducted in a seminar and one-and-one format. Lessons and labs are established by consultation between the cadet and faculty advisor.

3 Credit Hours

EV481 Water Resources Planning and Design

First Term—Prerequisite: Standing as a First Class cadet.
The course is concerned with effective use of water as a manageable natural resource. It begins with instruction on the tools required by water resource managers to make sound decisions in their field. The course assesses current needs for water and the structural (engineered) and nonstructural approaches available to meet these needs. Elements of engineering design and the design process are introduced. The bulk of the course is concerned with assessment of the impacts of various water resources development activities on the economic, socio-cultural and ecological sectors of the environment. Methods for conducting tradeoff analyses among the engineered and environmental aspects of projects are developed and applied in a term project. The course makes use of case studies of current water resource projects. Visiting speakers represent the views of the federal government and concerned public-interest groups.

3 Credit Hours

EV482 Military Geography

Second Term—Prerequisite: EV203.
History is replete with examples of the impact of terrain, weather, and climate on military operations at all scales. National strategies are influenced heavily by geographic realities of relative location, spatial interaction, population dynamics, and resource distribution. This course emphasizes the development of a geographic method for systematic analysis of the battlefield that is appropriate for platoon leader and corps commander alike. Students evaluate the elements of national power

and examine their geostrategic influences, past and present. The role of the environment in shaping today's Army and its missions is discussed. Jungle, cold region, alpine, riverine, desert, temperate and urban operational environments are examined for their effect on military planning and execution. Finally, cadets review case studies of the impact of these diverse environments on military operations at the tactical level.

3 Credit Hours

EV483 Colloquium in Geography

Second Term—Prerequisites: EV203 and EV365.
This colloquium is a directed-readings course using small-group discussions of important literature, methodological traditions, and contemporary research trends in the field of geography. Dependent on instructor preference and individual student interest, in-depth readings will be pursued in one or more of the following areas of geographic study: cultural, political, regional, or military geography. Compensatory time is given to permit extra readings.

3 Credit Hours

EV485 Special Topics in Geography and the Environment

Second Term—Prerequisite: EV203.
This course explores an advanced topic in Human and Regional Geography, Environmental Geography, Environmental Science, Environmental Engineering, or Geospatial Information Science. Specific subject matter will vary with the expertise of the visiting professor or senior faculty member conducting the course.

3 Credit Hours

EV486 Environmental Geography

First Term—Prerequisites: EV203 and EV365.
Whereas physical geographers focus on the Earth's surface and atmosphere, and human geographers concentrate on the spatial aspect of human activities, environmental geographers are interested in both how people adapt to specific environments and how they alter those environments through human activities. To understand these interactions and their implications, environmental geographers must fully appreciate natural processes and landform development within and on the surface of the Earth, as well as the implications of human intervention in the natural system.

3 Credit Hours

A human geography major at an AIDS orphanage on the shores of Lake Victoria, Tanzania.

Geography IAD cadets in front of the Temple Mount and Al Aqse Mosque, Jerusalem.

EV487 Environmental Security

Second Term—Prerequisites: EV203, standing as a First Class cadet.
This interdisciplinary seminar uses environmental security in a case study approach to study environmental issues potentially affecting U.S. national security. Cadets will explore environmental security topics, such as water, natural resource shortages, energy use and dependency, and global climate change, using an interdisciplinary approach from social, political, economic, and scientific-technological perspectives. The course culminates in a student team analysis of a developing country in terms of environmental security issues and the related U.S. national security interests. The final project includes a formal brief and written paper.

3 Credit Hours

EV488 Solid and Hazardous Waste Treatment and Remediation

Second Term—Prerequisites: EV394 and EV402.
This course examines the treatment, storage, and disposal of solid and hazardous wastes. Both regulatory requirements and evolving technology associated with solving modern solid waste disposal problems are discussed. Processes for the investigation and remediation of contaminated waste sites are presented, along with design methodologies for solid and hazardous waste disposal systems. The course culminates in the application of hazardous waste engineering to the cleanup of a contaminated hazardous disposal site.

3 Credit Hours

EV489A Advanced Individual Study I

Either Term—Prerequisite: Permission of department head.
The course is an individually supervised research and study program designed to provide cadets with the opportunity to pursue advanced topics within their disciplines. The cadet prepares a research and study proposal setting forth the objectives, scope, and anticipated accomplishments of his/her efforts for the semester. If required for a specific degree, the proposal will include a justification for engineering science or design credit. Once approved, the proposal serves as a basis for the cadet's research and study program. Progress in research reports and observations by the faculty advisor form the basis for grades. The program for each cadet will culminate in one of two outcomes: 1) a discipline-appropriate written product (e.g., senior thesis) with oral defense; or 2) enrollment in EV489B for the completion of the research and study program during the second academic term. Lessons and labs are established by consultation between the cadet and the faculty advisor.

3 Credit Hours

EV489B Advanced Individual Study II

Second Term—Prerequisites: EV480 and EV489A.
The course is an individually supervised research and study program designed to provide cadets with the opportunity to pursue advanced topics within their disciplines. The cadet uses a research and study proposal setting forth the objectives, scope, and anticipated accomplishments of his/her efforts for the semester. If required for a specific degree, the proposal will include a justification for engineering science or design credit. The proposal serves as a basis for the cadet's research and study program. Progress in research reports and observations by the faculty advisor form the basis for grades. The program for each cadet will culminate in a discipline-appropriate written product (e.g., senior thesis or design project) with oral defense. Lessons and labs are established by consultation between the cadet and faculty advisor.

3 Credit Hours

EV490 Advanced Environmental Engineering Design

Second Term—Prerequisite: Standing as a First Class cadet.

This is the final design course for the major in environmental engineering. Cadets experience the complete design experience, including defining the project scope, identifying design constraints, comparing alternatives, development of plans and specifications, engineering economics, and project management. The course centers on a senior design project that requires the integration of concepts developed in previous courses. Working in teams, cadets examine projects through the feasibility and concept design phases to evolve and develop concepts that are not only technically feasible, but economically, socially, and politically acceptable. The evaluation of alternatives employs trade-off analysis and the use of multi-attribute decision models. The final product includes a formal oral briefing and written design specifications. In addition to project management, course lectures cover engineering ethics, engineering economics, and topical coverage of fundamental engineering topics relevant to the problems under study. The course concludes with a field data collection exercise where cadets develop collection protocols, execute the data collection plan, analyze results, and present their findings.

3.5 Credit Hours

EV498 Advanced Geographic Information Systems

First Term—Prerequisite: EV398.

This course examines the analytical methods used in Geographic Information Systems (GIS) and provides cadets with a clear understanding of the theoretical/conceptual aspects of algorithms found in GIS software. Lectures focus on the underlying mathematical basis for widely used spatial analytical techniques. Among the topics covered are neighborhood operations, map transformation, spatial interpolation, terrain analysis, network analysis, spatial overlay, fuzzy sets, neural networks, and expert systems. In-class practical exercises and laboratory assignments complement the lectures by providing hands-on experience with a variety of advanced analytical techniques. The course culminates with a capstone term project that allows cadets to identify a scientific problem, formulate a hypothesis, use GIS to solve the problem, and then present the results of their analyses.

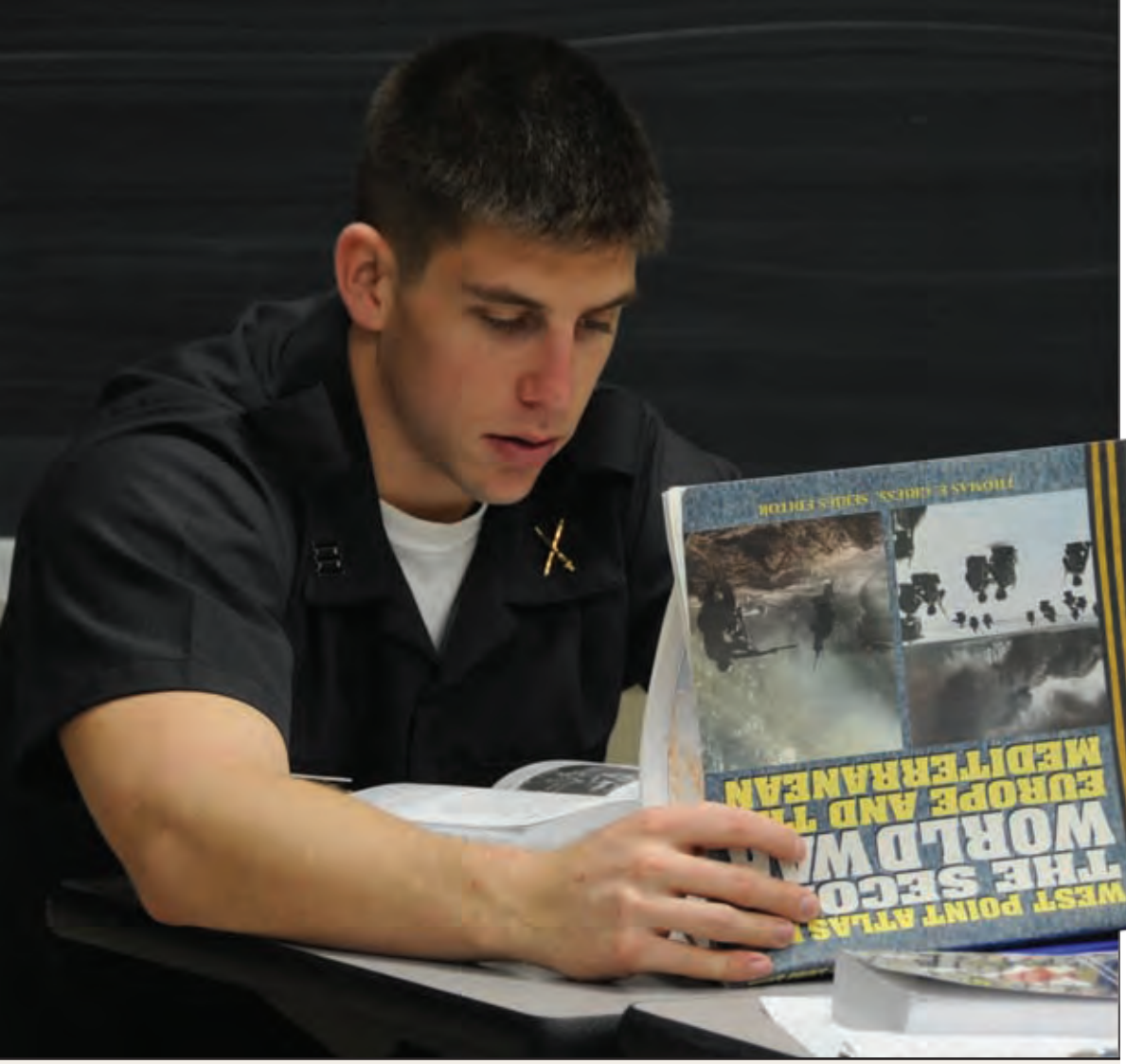
3 Credit Hours

XS391 Principles and Applications of Environmental Chemistry

First Term—Prerequisites: CH102/CH152, MA103/MA153 and MA104.

This course examines chemical interactions of pollutants in air, soil, and water systems. The focus of the course is problem solving with the following topic coverage: approximately 80 percent applied aquatic chemistry, 15 percent environmental organic chemistry, and 5 percent applied analytical chemistry. Specific topics include the chemistry applied in drinking water production and the chemical aspects of industrial and hazardous waste treatment. The fate of heavy metals and organic contaminants in soil and aqueous systems also is discussed.

3 Credit Hours



"Much of the history we teach was made by people we taught."

History is the study of the human past, with an eye to influencing the present and shaping the future. By examining the human experience, cadets can acquire an understanding of how previous generations and different societies have sought to understand their environment and shape their destinies. From this understanding, cadets expand their breadth of experience and gain insights into current problems and future challenges. In the process of examining the development of those societies, institutions, and ideologies, they will enhance their ability to think critically, research effectively, and communicate persuasively, both orally and in writing. Moreover, they will establish an analytical

framework for studies in related fields and an intellectual foundation for an Army career and lifetime of service to the nation.

Cadets may pursue a major in one of four fields: American History, International History, Military History, or Defense and Strategic Studies. Each offers flexibility, permitting cadets to develop a foundation of historical perspective as well as pursue specialized studies in world regions, languages, and other disciplines.

History Major

The major in history offers cadets an opportunity for in-depth study in one of three areas: military history, international history, and American history. Most cadets who major in history will write a senior thesis that requires detailed research in primary sources. An honors program is available for high achievers.

Defense and Strategic Studies Major

The Defense and Strategic Studies major offers cadets the opportunity to pursue a multidisciplinary approach to the study of the modern military profession and national security. Electives allow cadets to examine military operations and defense policy and strategy through a historical approach. Cadets take courses in a number of disciplines, to include military science, history, social sciences, law, and geography. An honors program is available for high achievers.

Standard Courses

HI103 History of the United States

First Term—Prerequisite: None.

This course treats the history of the United States in an international context, from the nation's colonial origins to the present. Both this course and HI104 explore the American experience by investigating such diverse topics as economic, political, and social evolution; foreign relations developments; the rise of sectionalism; cultural and intellectual growth; group interactions, and the relation between war and society. The courses also introduce methods of historical research and analysis, and seek to develop the cadet's facility for critical thinking and lucid writing, and for participating effectively in oral discussion.

3 Credit Hours

HI104 History of the United States

Second Term—Prerequisite: HI103 or equivalent.

This course treats the history of the United States in an international context, from the nation's colonial origins to the present. Both this course and HI103 explore the American experience by investigating such diverse topics as economic, political, and social evolution; foreign relations developments; the rise of sectionalism; cultural and intellectual growth; group interactions, and the relation between war and society. The courses also introduce methods of historical research and analysis, and seek to develop the cadet's facility for critical thinking and lucid writing, and for participating effectively in oral discussion.

3 Credit Hours

HI107 History of Western Civilization: Ancient Times to 1914

First Term—Prerequisite: None.

HI107 is the first half of a two-semester sequence intended to build for cadets a historical foundation before they conduct an in-depth survey of another civilization in HI108. This course traces the human experience from ancient times until 1914. Beginning with an examination of the origins of Western Civilization in the Middle East, HI107 then explores the development of Western Civilization through the classical, medieval, early modern, and modern periods, ending with an examination of the causes leading to the First World War. The roots and formative events of the West are examined in depth to provide a cultural, social, economic, political, and military framework for the understanding of Western Civilization. This course also develops methods of historical research and analysis. It seeks to develop the cadet's facility for critical thinking, lucid writing, and effective participation in classroom discussion.

3 Credit Hours

HI108 Regional Studies in World History

Second Term—Prerequisite: Successful completion or validation of HI107/HI157.

HI108, in the first block, completes the study of the development of Western Civilization begun in HI107, starting from World War I and continuing to the present day. The remaining two blocks focus on a detailed study of the development and critical events in the history of one of five regions: Africa, East Asia, Latin America, the Middle East, or Russia. The dual focus (Western Civilization and one other region) enables cadets to develop a deeper understanding of a different culture and unfamiliar ideas and concepts. The course also develops methods of historical research and analysis, and seeks to develop the cadet's facility for critical thinking, lucid writing, and effective participation in classroom discussion.

3 Credit Hours

Advanced Courses

HI153 Advanced History of the United States

First and Second Terms—Prerequisite: Approval of associate professor in American history.

This course and HI154 encompass the same chronological period and thematic coverage as HI103-HI104, but they do so through monographic and periodical literature and greater emphasis on classroom discussion. These courses assume some familiarity with American history and consequently place special emphasis on historical analysis and criticism. Moreover, students acquire a broader understanding of American history and the historian's methods.

3 Credit Hours

HI154 Advanced History of the United States

First and Second Terms—Prerequisite: Approval of associate professor in American history.

This course and HI153 encompass the same chronological period and thematic coverage as HI103-HI104, but they do so through monographic and periodical literature and greater emphasis on classroom discussion. These courses assume some familiarity with American history and

consequently place special emphasis on historical analysis and criticism. Moreover, students acquire a broader understanding of American history and the historian's methods.

3 Credit Hours

HI157 Advanced History of Western Civilization: Ancient Times to 1914

First Term—Prerequisite: Selection by the associate professor and chief of the International Division based upon SAT scores, AP/IP scores, or previous university-level history courses.
HI157 encompasses the same chronological period and thematic coverage as HI107, but it places a greater emphasis on classroom discussion and historical analysis and criticism. Consequently, the cadet acquires a broader and deeper appreciation of the historian's craft and of essential issues in Western Civilization.

3 Credit Hours

HI158 Regional Studies in World History

Second Term—Prerequisite: Successful completion or validation of HI107/HI157 and selection by the associate professor and chief of the International Division.
HI158 encompasses the same chronological period and thematic coverage as HI108, but it places a greater emphasis on classroom discussion and historical analysis and criticism. Consequently, the cadet acquires a broader and deeper appreciation of the historian's craft and of essential issues in World History.

3 Credit Hours

HI301 History of the Military Art

First Term—Prerequisite: Standard History sequence or validation.
This two-term, upper-class core course traces the evolution of the art of war from the ancients through the Napoleonic era to the American Civil War and the wars of the 20th century. Emphasis is placed on the changing nature of warfare as nations adjust to social, political, economic, and technological developments. Analysis focuses on causation, the interrelationship of events as warfare evolved over the ages, operational and logistical aspects of military history, and the role of society in warfare.

3 Credit Hours

HI302 History of the Military Art

Second Term—Prerequisite: HI301.
This two-term, upper-class core course traces the evolution of the art of war from the ancients through the Napoleonic era to the American Civil War and the wars of the 20th century. Emphasis is placed on the changing nature of warfare as nations adjust to social, political, economic, and technological developments. Analysis focuses on causation, the interrelationship of events as warfare evolved over the ages, operational and logistical aspects of military history, and the role of society in warfare.

3 Credit Hours

HI337 China – Central Kingdom to Communist Rule

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course traces the history of China from ancient times to the present. It briefly introduces the emergence of a distinct Chinese civilization, in thought, culture, and political structure. It then considers how China was transformed by the introduction of Buddhism and the experience of cosmopolitan empire under the Tang. Next it examines how China fared in the multi-state system that endured from 960 to the Mongol conquest, and then as the Late Imperial state under the Ming and "foreign" Manchu rule. It considers the search for "new China" in the Republican, Warlord, and Nationalist periods following the collapse of the Late Imperial state. It shows why Mao came to represent a new utopian vision and how that vision tragically failed. Finally, the course explores how the search for "new China" and historical legitimacy continues today both on the mainland and in Taiwan.

3 Credit Hours

HI338 Warfare in the Age of Revolutions

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the theory and practice of warfare in Europe during the Age of Revolutions, roughly considered to be 1750 to 1814. Political revolutions, such as the American and French Revolutions, along with other revolutions, such as the Agricultural and the Industrial, and the intellectual ferment spawned by the Age of Enlightenment, all resulted in significant changes in the conduct of warfare. This course will examine those events, with particular focus on their relevance to the art of warfare. Themes include changes in military organization, doctrine, technology, and the accompanying social, political, and economic factors that influenced the armies of the day. The course will also cover the wars and campaigns that took place during this timeframe, including the American and French revolutions and the wars of Napoleon.

3 Credit Hours

HI339 The Modern Middle East

First Term—Prerequisites: HI104. HI108, HI154 or HI158.
This course enables cadets to explore the social, political, economic, and military interactions in the formation of the Modern Middle East. The first block examines the decline of the Gunpowder Empires and the subsequent penetration of European colonialism into the Islamic world (India, North Africa, Egypt, and the Levant), with emphasis on the factors that led to military decline of the Turkic world and the relative economic and military advantages of the European powers. During this block, students will discuss the Middle East's modernizing and reform efforts that European colonialism helped to catalyze, to include democratization, constitutions, capitalism, and industrialization. The second block covers the events that follow the world wars and subsequent decolonization of the Middle East against the backdrop of the Cold War. Cadets will closely examine the Arab-Israeli conflict, the rise of Arab nationalism and the tension between military revolutionary dictatorship and attempts at constitutional monarchy and republics. The final phase will begin with the Iranian revolution of 1979 and the Soviet invasion of Afghanistan. It will consider the rise of political Islam as a revolutionary ideology and the post-Cold War challenges leading to current wars and insurrections.

3 Credit Hours

HI340 Colonial America

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the international, political, social, cultural, and economic origins and development of colonial North America prior to the war for independence, with attention to French and Spanish as well as British colonies. It explores the development of American identities and the significance of colonization and intercultural encounters for all the peoples, native and European, of North America.

3 Credit Hours

HI341 The Age of Exploration

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course concentrates on the on the "Age of Exploration" and its impact on the early modern world, 1453-1715. It provides students interested in the history of early modern Europe, the Atlantic world, the history of Africa and colonial Latin America a general understanding of the ideologies and institutions that enabled Europe to colonize parts of Africa and the Americas during this important period in world history. Specific topics include: medieval precedents of early modern imperialism; theories of monarchy and empire; ideologies of conquest and colonization; the continuity of native cultures and beliefs; the relevance of race and slavery in understanding European influence in Africa and the Americas; and the creation of an Atlantic economy.

3 Credit Hours

HI342 The British Isles Since 1688

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course examines the rise and fall of one of the greatest empires of modern history. How did a tiny, insular nation become the world's most formidable imperialistic power and then, in the afterglow of high Victorian achievement, evolve into a post-industrial welfare state? In answering this question students will have the opportunity to deal with the great military, social, economic, and political issues that shaped modern Europe. Key events and themes include the Glorious Revolution, the Seven Years' War, the loss of the American colonies, the impact of the French Revolution and Industrial Revolution, the rise of democracy, the triumph of socialism, the age of total war, and the transition to the Cold War.

3 Credit Hours

HI343 Modern Germany

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course is a survey of the German lands from the dawn of the modern era through contemporary times. The course will combine social, political, economic, and cultural history in examining crucial themes and developments related to the German-speaking regions. Cadets will consider German nation and state formation; social, demographic, and economic transformation; imperialism, war, and ideological change; the transformation of male and female roles; and trends in high and popular culture. The course will include a significant segment on 20th-century Germany and the role the German state played in determining the course of world history, whether as the Nazi state that unleashed the Holocaust or as the West German Cold War bulwark. German history has much to teach us and has led to enormous debates about the nature of the modern era.

3 Credit Hours

HI344 Modern Diplomacy

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

The course focuses on the major diplomatic developments in Europe from 1814 through the end of the Cold War in 1991. It traces the emergence of the European state system after the Treaty of Westphalia and the impact of the revolution in France on European diplomatic relations. It examines the diplomatic system established at the Congress of Vienna through the crises and conflicts of the mid-19th century. The course also examines the various factors that led to the First World War, the developments of the interwar period, the origins and conduct of the Second World War, and the origins of the Cold War. The final lessons will explore Europe's role in the Cold War, the rise of international organizations, transnational diplomacy, the end of the Cold War, and recent modifications to Europe's role in world affairs.

3 Credit Hours

HI345 Modern Africa

First Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course takes a thematic approach to African history, describing the forces that led to the partitioning of the continent, the practices of European colonialism/imperialism, the emergence of independent African states, and political, economic, and social developments in contemporary Africa. The goal of the course is to focus on critical events, relationships, and themes on the continent that continue to effect current events.

3 Credit Hours

HI346 Modern South Asia

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course enables cadets to explore the social, political, economic, religious, and cultural history of modern South Asia. The course will examine the foundation of Indian religious and cultural traditions, and the related social, political, and economic developments in early India. It then examines the late Mughal Empire, the domination of India by the British, the struggles for independence, and the partition of South Asia into India, Pakistan, and Bangladesh in the contemporary era.

3 Credit Hours

HI347 Asian Warfare and Politics

First Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course explores the interaction between warfare and political systems in East Asia. It begins with the transition from military monarchy to bureaucratic empire in the Warring States Period. It then maps the rise of nomadic confederations in the Inner Asian Steppe and their strategic interaction with the Han state. It traces how the collapse of the Han state led to military turmoil in East Asia, the rise of hybrid states, a new cosmopolitan empire, and then a multi-state system. It considers how, in Japan, the importation of the bureaucratic state led first to centralization and then to the rise of the samurai and a feudal structure. Next, the course examines the development of a new form of nomadic confederation under the Mongols, and how Mongol warfare led to a more centralized state in China, and turmoil and a federalist system in Japan. In the modern period, the course considers how the challenge of Western military force led to political turmoil and the rise of the Communists in China, but in Japan led to the building of the Imperial Army, noted for its competence and for its atrocities. The course concludes with reflection on how the experience of war in East Asia continues to affect the region's politics and political structures.

3 Credit Hours

HI348 Modern Latin America

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course surveys the cultural, economic, political, and social evolution of Latin America from the era of independence to the present. The course begins with a brief examination of Pre-Colombian and colonial events and structures. Students will study the economic development of modern Latin America and its influence on social, political, and military change. Case studies of national histories, such as Mexico, Cuba, Brazil, Argentina, and other countries, help to illuminate the broad themes that underlie modern Latin American history. The course will examine Latin American relations with the United States and other nations of the world.

3 Credit Hours

HI349 The Middle East to 1798

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course enables cadets to explore the social, political, economic, and military interactions in the development of the Islamic world before European colonization. The first block examines the growth of the Islamic world from the advent of Muhammad and through the early phases of military conquest, with emphasis on why Islam was appealing in its formative era, how the religion was structured, and what factors allowed for its political, economic and military success. The second block covers the subsequent evolution of the Caliphal empires, emphasizing the changing nature of political authority and legitimacy, the evolution of political institutions, and the challenges to Caliphal hegemony. The third block will examine the arrival of the Steppe peoples into the Middle East (Mamluks, Seljuk Turks, Mongols), and how new political, social and military structures were introduced, eventually shaping the development of the late Turkic Gunpowder Empires: the Ottomans of Europe and the Near East, the Safavids of Iran and Central Asia, and the Mughals of India. Cadets will assess what created the military strength of these empires and what led to their decline.

3 Credit Hours

HI355 Warfare in the Age of Industrialization

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the history of warfare around the globe, from the Congress of Vienna through World War I and its aftermath. It combines the study of military campaigns with the political, economic, social, and cultural factors shaping military developments. It explores the impact of changing technology on the conduct of war, the development of nationalism, wars between nation-states, and wars for national freedom. This course contains several themes particularly useful to any modern Soldier. Among them are the nature and intensity of national wars and the effect of changing technology on society and the conduct of war.

3 Credit Hours

HI356 War at Sea and in the Air

Second Term—Prerequisite: Standard History sequence or its validation.
This course examines war at sea from the early days of galley warfare through the ages of sail, steam power, all-steel navies, nuclear power, and missiles. War in the air is examined from the early days of balloons and lighter-than-air ships through missile age. Course themes include the evolution of military organizations, technology, strategy, leadership, and the accompanying social, political, and economic factors that influenced the navies and air forces of the day. The course will also cover selected wars and campaigns in which naval and air power played important roles.

3 Credit Hours

HI357 Warfare Since 1945

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
The nature of warfare has changed dramatically since 1945. During the Cold War, American policies of containment and collective security collided with attempts at communist expansion. The threat of nuclear war led to an era of limited war, including revolutionary war, wars of national liberation, and civil wars. Cadets will examine the strategic conditions and political considerations influencing the use of force in all types of warfare. They will gain an appreciation for the experiences of soldiers and leaders in combat, while analyzing military strategy and exploring the connection between war and society.

3 Credit Hours

HI358 Strategy, Policy, and Generalship

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines how political and military leaders develop and execute policy and strategy. The course begins with an examination of the rise of military professionalism and the creation of military staffs in the 19th century. It explores how political and military leaders integrate not only military power, but also diplomatic, economic, technological, social, and political resources to achieve a nation's goals. In particular, the course examines the often contentious issues of civil-military relations, joint and coalition warfare, and organizational and doctrinal change. Cadets study the strategic challenges faced by senior civilians and military leaders, thus allowing them to analyze warfare within a broader political-military context.

3 Credit Hours

HI359 Era of the Second World War

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the Interwar Years, 1919-1939, and the Second World War from a global perspective, while using a thematic approach to compare the different experiences of each of the major belligerents. Whether covering the Versailles Treaty, the rise of Adolf Hitler, the U.S. Army during the Great Depression, home fronts, or the Holocaust, the cadets in this course will examine the social, political, cultural, and economic factors that contributed to how belligerents waged war, and, in turn, how war affected each of these factors across the globe. The course covers how and why the belligerents planned and executed particular strategies and operations in the European, Pacific, and China-Burma-India theaters to achieve their coalition and national goals. Finally, this course examines the interrelationship of sea, air, and land forces, and the complexities of providing logistical support to joint and combined operations on an unprecedented scale.

3 Credit Hours

HI361 Medieval Europe

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
The millennium between the "fall" of the Roman Empire and the Voyages of Discovery – the Middle Ages – has often been characterized as brutish and inferior. Yet, this tough, fascinating society offered immeasurable potential for growth and adaptation. The personages and events of the European medieval world spawned many of the ideas and institutions of modernity. Topics for study will include the barbarian invasions, Byzantine Empire, Carolingian Europe, feudalism,

medieval technology, Christian Church, medieval warfare, Crusades, rise of universities, crises of the 14th century, growth of monarchical power, and economic and social change.

3 Credit Hours

HI364 Modern Western Europe Since 1789

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course is an introduction to European history from 1789 to the present. The course considers how and why Europe – a small, relatively poor, and politically fragmented place – became the engine of globalization and an important civilization in its own right. Our approach is broadly cultural, using politics, economics, society, religion, and other arenas to understand the events and people of Modern Western Europe. Chief topics: French Revolution, liberalism and the industrial revolution, socialism and the rise of labor, modern colonialism, world wars, communism and capitalism, decolonization, Cold War, and the European Union.

3 Credit Hours

HI365 The Ancient World

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course examines the political development, cultural ideas, and fundamental institutions of the ancient societies that form the basis of Western civilization. The course will focus on civic values that established standards regarding the role of the individual within the community and how concepts of virtue, duty, and service evolved over time in response to internal and external challenges. It explores in detail significant historical questions, such as how Athenian democracy contributed to, and was dramatically affected by, the Peloponnesian Wars, and why the Romans' victory in the Punic Wars planted the seeds for the ultimate demise of the republic and the transition to the empire. HI365 also serves as an introduction to historical methods of analyzing primary sources. Cadets will read extensively from histories written by ancient Greek and Roman authors and form their own interpretations of the events the writers cover, their historical methods, and their reliability.

3 Credit Hours

HI367 Imperial and Soviet Russia

First Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course examines the political, social, and cultural history of Russia as it emerged from the Mongol era up to the present day. It explores the development of the tsarist political and social systems, the emergence of literary, artistic, and revolutionary movements, and the development of Russia's position in European politics from the time of Peter I through WWI. It also covers the rise of the Soviet Union, the leadership's attempts to implement communist ideology and responses to that attempt, Russia's relationship with various national and ethnic groups, and the emergence of the Soviet Union as a superpower. The course concludes with the collapse of the Soviet Union and the emergence of new states in the 1990s.

3 Credit Hours

HI368 Modern Central and Eastern Europe, 1896-1989

First Term—Prerequisites: HI104, HI108, HI154 or HI158.

Between 1896 and 1989, Central and Eastern Europe experienced two world wars, at least three major revolutions, and radical industrial and environmental dislocations. The region witnessed everything from the birth of its modern culture to the creation of new post-World War I nation-states, to the Holocaust, to massive forced population shifts, to the creation of the communist Eastern Bloc, to the popular overthrow of Communism in 1989. Radical regimes on the right and left brought incredible change, quashed hopes, and produced both progress and suffering of unprecedented proportion. This course will examine life in late-19th and 20th century Habsburg Europe and its successor states of Poland, Hungary, Czechoslovakia, and Yugoslavia. It will do so comparatively, highlighting themes of nation-creation, everyday life, social transition, war, revolution, and ethnic cleansing.

3 Credit Hours

HI369 American Frontiers

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.

HI369 enables cadets to explore the social, political, economic, and military interactions between many diverse cultures in North America during the period of European and U.S. expansion since 1500. The course does this by examining the history of Native America and the "American" West, which included much of colonial British North America, and much of the American South through the 1830s, along with Spanish, French, and other European frontiers in North America. The course integrates Native American, Latino, and economic history in the study of migration, cultural contact, and "international" relations on the frontiers of North America. The course also explores change and diversity in cultural perspectives by examining myths of the West from a range of ethnic and other viewpoints. The course is an elective in the American History stem of the History program, but can be taken for credit in the International stem as well.

3 Credit Hours

HI370 Ancient and Medieval Warfare

First Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course focuses on warfare from the dawn of recorded history through the 14th century. Thus, it will provide cadets with opportunities to study the campaigns of Alexander, the military methods of the Romans, the military aspects of feudalism, the Scottish war of independence, and other topics that are not covered in the core military courses. Although the course includes in-depth analyses of certain battles and campaigns, it places more emphasis on "war and society" issues, such as the relationship between military participation and social standing in human societies, the connections between armies and governments, and the impact of economic, technological and social change on military structures. Also, HI370 will shift some emphasis away from the operational level of war to the analysis of the strategic and tactical levels of war, and away from use of secondary sources to use of primary materials.

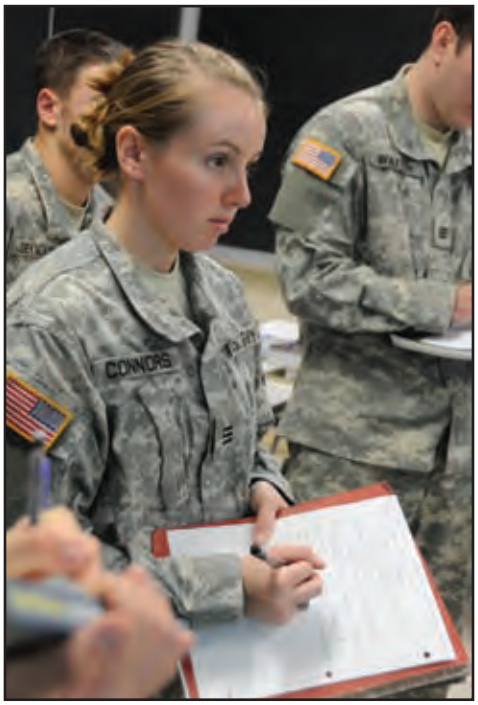
3 Credit Hours

HI372 History of United States Foreign Relations in the Twentieth Century

First Term—Prerequisites: HI104, HI108, HI154 or HI158.

This course examines American foreign relations from the nation's entry into the world arena as a major power in 1898 through both world wars and the Cold War, to its station in today's multi-polar world. It is a study of the forces, events, personalities, and principles that have shaped America's role in the world and provided the framework for the development of current foreign policy.

3 Credit Hours



HI376 Early Modern Warfare

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the history of warfare in Europe from the Renaissance through the campaigns of Frederick the Great. It combines the study of military campaigns with that of the political, economic, social, and cultural factors shaping military developments. It explores the so-called "Military Revolution" of the 16th and 17th centuries with particular emphasis on the relationships between military developments and state building, the rise of absolutism in France and the Wars of Louis XIV, and the rise of Prussia and the Wars of Frederick the Great. Study of the so-called "age of limited war" sets the stage for future study of the American Revolution and the wars of the French revolutions and Napoleon. This course contains several themes particularly useful to the modern Soldier. Among them are the nature, intensity, and complexity of wars of religion.

3 Credit Hours

HI381 History of Unconventional Warfare

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
The course examines unconventional warfare from a historical perspective, particularly conflicts involving opponents with a significant disparity in their conventional military capabilities. Through several case studies, the course explores why belligerents succeed or fail in unconventional warfare and how ideology, technology, and social, political, and economic factors help determine the outcome of wars between regular and irregular forces. Covering a broad period of history, selected case studies include wars of conquest or colonization, revolutionary wars, and peacekeeping or constabulary operations.

3 Credit Hours

HI385 War and Its Theorists

Second Term—Prerequisites: HI301-HI302 (may be taken concurrently).
Along with great commanders in history, there have been men who theorized about the nature and conduct of war, the relationship between politics and strategy, and the impact of warfare upon society. The course examines the contributions of selected theorists (Clausewitz, Sun Tzu, Jomini, Mahan, Fuller, Liddell Hart, Brodie, etc.). The cadet reads the theorists' major writings, analyzes their principal ideas, and studies their influences on military affairs. This will help the cadet reach his or her own conclusions about fundamental questions concerning the conduct and fundamental nature of war, such as the relative strength of offense vs. defense, or of material vs. morale factors.

3 Credit Hours

HI390 Early National America

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
Although the Constitution outlined the form of federal government in the United States, it left unanswered many questions concerning how that government should function. This course examines how, between 1790 and 1848, evolving political thought, economic development, changing social conditions, and sectionalism influenced successive generations' debates about the role of government in American life.

3 Credit Hours

HI391 History of World Religions

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course analyzes the emergence, development and present cultural expression of the major religions of the world, emphasizing their 19th and 20th century experience. It also examines the development of religion in the ancient world and in pre-literate and non-technical societies. Cadets study the world's religions as molded by and as molders of the social, political and economic forces unique to particular cultures. Special attention is paid to the role of each religion in the formulation and adaptation of public and foreign policy.

3 Credit Hours

HI394 Revolutionary America

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the social, political, and economic origins and consequences of the American Revolution through the adoption of the Constitution. It explores the development of an American identity and the meaning of the Revolution for all Americans, to include women, African Americans, and the poor.

3 Credit Hours

HI395 History of Civil War America

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course focuses on the causes and consequences of the American Civil War. Cadets will analyze the road to war, the war itself, and Reconstruction to place the entire period in its broader historical context. The course covers the ante-bellum South and North, focusing on the peculiar effect of slavery on society. Cadets will examine the home fronts to see the populace's reaction to war as both the Union and the Confederacy engage in conflict. In approaching Reconstruction, cadets will focus on the political, economic, and racial policies that were implemented to rebuild the nation.

3 Credit Hours

HI396 The Making of Modern America

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
Between 1877 and 1945 the United States fought three major wars, experienced dramatic economic growth, suffered the Great Depression, underwent significant social change, and emerged as the premier world power. This course analyzes these and related issues, emphasizing how and why the United States developed during the last quarter of the 19th century and the first half of the 20th century, and stressing the promises and problems that accompanied the making of modern America.

3 Credit Hours

HI397 Cold War America

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the history of the United States from the end of World War II through the Reagan presidency. It assesses the political, social, and economic institutions of America in the dynamic context of relations with the Soviet Union. While the course deals primarily with domestic America, cadets will gain an appreciation for the close relationship between events at home and abroad.

3 Credit Hours

HI398 Society and Culture in American History

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
HI398 examines the evolution of American society from the perspective of the family and evaluates the influence of group identification – class, race, gender, and ethnicity. Other topics include consumerism, sports, religion, and wars as factors that modify and enrich the social and cultural spectrum.

3 Credit Hours

HI460 Senior Faculty Course

Second Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course is taught by a senior member in the Department of History in a field of that historian's expertise. The course offers students

the opportunity to study under the guidance of a historian in topics not normally offered by the Department of History.

3 Credit Hours

HI461 Topics in Gender History

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
This course examines the development of gender relations, concepts, and roles in historical perspective. Topics may include gender in the military and warfare, the European experience, the American experience, or international comparisons of gender.

3 Credit Hours

HI462 Science and Technology

Second Term—Prerequisites: HI104, HI108, HI154 or HI158. Corequisite: IT305 or IT355.
This is an elective course focusing on the history and development of science and technology. Specifically, cadets will study how science and technology have interacted with cultural, social, political, and military institutions. This course will examine two episodes considered crucial in the making of the modern world: the Scientific Revolution of the 17th century, which established the most important features of present-day science (experiments, laboratories, and mathematical and mechanistic ways of explanation), and the Industrial Revolution of the late-18th and 19th centuries, which created modern industrial society (labor relations, consumer products, classes, politics, etc.). Cadets will evaluate the dangers of determinism, both in scientific and technical fields, as they analyze the military-industrial-scientific complex of the late 20th century. The final lessons will require cadets to combine the knowledge acquired during this and other courses to assess some of the present and future scientific and technical challenges the U.S. Army and other American institutions face.

3 Credit Hours

HI463 Race, Ethnicity, and Nation

First Term—Prerequisites: HI104, HI108, HI154 or HI158.
We use the words "ethnicity," "race," and "nation" constantly, but what do these terms really mean? Why are people willing to kill or persecute each other in the name of these ideas? The course will allow cadets to investigate the development of the concepts of ethnicity, race, and nation. They will examine modern conditions such as the Enlightenment, science, the growth of the state, Social Darwinism, and imperialism, and study why these conditions gave rise to diverse but overlapping methods of creating boundaries and defining difference. Although the main focus of the course will be on Europe, the application of these ideas in a variety of global settings – on other continents – will be considered throughout the course.

3 Credit Hours

HI498 Colloquium in History

First Term—Prerequisite: Approval by head of the department; limited to cadets who are working toward a major in History.
The colloquium employs seminar discussions of important books and scholarly articles to enhance understanding of major historical issues. Subcourses are designed to provide in-depth study of various topics in American, European, military, and international and strategic history. Cadets select a subcourse topic as the basis for their reading programs after consultation with their faculty advisors or departmental counselors. Subcourse topics may vary each year in accordance with cadet interest and faculty expertise. Cadets who major in History should complete a colloquium that will support their subsequent enrollment in HI499 Senior Thesis in History. The colloquium satisfies the 400-level course requirement for the history fields of study.

3 Credit Hours

HI499 Senior Thesis in History

Second Term—Prerequisite: Approval by head of the department; limited to cadets who are working toward a major in History.
The course provides cadets selecting the major in History with an opportunity to enhance their skills in historical research and analysis. For this reason the course serves as excellent preparation for graduate study in history and related disciplines. Based upon their backgrounds and research interests, cadets are organized into small thesis-writing seminars. Under the supervision of a seminar advisor, each cadet defines a topic, develops a research plan, accomplishes research, and drafts a thesis. The seminar meets occasionally to discuss issues in historiography and methodology, review progress in research, and critique draft papers. At the end of the semester cadets present their findings and defend their theses before a committee of faculty and fellow cadets.

3 Credit Hours

The Department of Law manages two majors in undergraduate legal studies: American Legal Studies and International and Comparative Legal Studies. These programs, through required and elective courses, examine law as a primary means of maintaining societal order, balancing individual interests with the interests of society, and resolving inherent conflict. Department courses are offered to Legal Studies majors, cadets in related disciplines, and those who are interested in broadening their understanding of the important role of law in the domestic and international contexts. The Department of Law also offers instruction in the academy's core course in constitutional and military law to First Class cadets. This course prepares cadets to recognize and evaluate fundamental constitutional issues in American society and to appropriately exercise the legal authority of an Army officer and commander.

Standard Courses

LW310 Introduction to Legal Method

First Term—Prerequisite: None.
This course provides the foundation for studying law. It begins with a study of jurisprudence and legal theory. Jurisprudence denotes the philosophy of law, an approach that considers the sources and nature of the law and legal systems and encompasses such themes as natural law and legal positivism. Legal theory looks at law and legal theory from the perspective of other disciplines, such as sociology and economics. The course will further explore the nature, function, sources, and structure of the prevalent legal systems of the world. Cadets will use these skills to explore systemic methods of legal analysis and apply those methods to the interpretation of cases, statutes, regulations and constitutions.

3 Credit Hours

LW399 Legal Practice – Internship

Prerequisite: Department approval (Part of summer Individual Academic Development).
This course provides the opportunity for three-week individual internships with attorneys and legal offices across the full gamut of legal practice. This includes internships with the highest offices in the federal government, including the U.S. Supreme Court and the White House Chief Counsel's Office; internships at international tribunals, such as the International Criminal Tribunal for Yugoslavia and the Special Court for Cambodia; managed internships, like the War Crimes Staff Ride and the Point to Point Project in Liberia; legal offices of major U.S. corporations and foundations, such as the Audia Group; and also local sheriffs', judges', and prosecutors' offices around the country. Evaluation based on research and writing project, daily journal, and oral presentation.

1.5 Credit Hours

LW403 Constitutional and Military Law

Either Term—Prerequisites: SS202; only First Class cadets or permission of the Department of Law.
This course studies the United States Constitution and the military justice system. Cadets will acquire information and skills in order to recognize and resolve constitutional and legal problems. The course provides analytical models for dealing with problems regarding societal and military order. It seeks to enable the cadet to make an intelligent commitment to the values and preferences embodied in the Constitution and our system of military and civilian law. Significant court decisions are explored to support the course goals. Specific substantive areas include: separation of powers, individual rights, due process, civilian and military criminal procedure, and military criminal law.

3 Credit Hours

Elective Courses

LW410 Comparative Legal Systems

Both Terms—Prerequisite: None.
This course uses a comparative approach to study the three major legal systems of the world: the English common law system, the civil law system (and its branches) of continental Europe, and the Islamic legal system. These three systems are the foundation for the laws and legal systems of most of the world today, including Latin America, Africa, the Middle East, and East Asia. Similarities and differences between these systems and the law and legal studies are explored. Social, political, and economic factors that distinguish these systems and more recently have begun to integrate them are covered. Emphasis is placed on the sources of law, the procedures for resolving legal disputes, and basic principles of civil and criminal justice.

3 Credit Hours

LW472 Criminal Law

Both Terms—Prerequisite: None.
This course will examine the legal, social, religious, cultural, and political motivations that justice systems use to characterize certain actions as "criminal." The course will revolve around the traditional reasons for criminal law, namely blameworthiness and punishment, and also examine how institutions use criminal law to serve their narrow interests. This course will introduce theories surrounding criminal law and illustrate how cadets may apply law immediately in their roles as officers. The course will examine federal and state criminal codes and also the Uniform Code of Military Justice. From a legal perspective based on the U.S. Constitution and other criminal codes, some of the topics covered include the death penalty, insanity, corporate crime, conspiracy, murder, necessity, and self-defense.

3 Credit Hours

"Law is the strongest link between man and freedom."

John F. Kennedy
Law Day Proclamation,
May 1, 1961

LW474 Law of War for Commanders

Either Term—Prerequisite: None.
This course is designed to develop in each cadet an understanding of basic law of war (LOW), with an emphasis on issues that might arise on the battlefield at a tactical level. The ethical and historical background of LOW will be examined, including Geneva Conventions and protocols, and how LOW is enforced on international and national levels, to include prosecution under the Uniform Code of Military Justice. Illustrative examples will include the Nuremburg Tribunal, My Lai, and the Gulf War.

3 Credit Hours

LW475 Advanced Constitutional Law Seminar

Either Term—Prerequisite: LW403.
This seminar course covers a broad range of traditional and contemporary constitutional law topics. In addition to studying U.S. Supreme Court cases in particular areas of constitutional law, cadets will study the historical foundations of the U.S. Constitution and underlying theories and principles of constitutionalism. The seminar focuses on the role of the Court, various judicial philosophies, and the methodologies judges use to interpret the Constitution and decide cases. The seminar format demands active participation in classroom debate, role playing, and critical thinking about complex issues of law and policy. The seminar typically travels to the Supreme Court to hear arguments in a case that has been studied in class.

3 Credit Hours

LW481 International Law

Both Terms—Prerequisite: None.
LW481 is a required course for the International and Comparative Legal Studies major. Students examine the theoretical origins and sources of international law (such as treaties and customary international law), how international law is enforced, and how international law influences interactions between states and their citizens. The course also explores the ways in which international law is now being used to effect global governance through institutions such as the United Nations, international criminal tribunals and the World Trade Organization. As to each of these topics, the course surveys the relationship of international law to the laws of the United States and to the constitutional powers of the federal government.

3 Credit Hours

LW482 National Security Law Seminar

First Term—Prerequisite: None.
This seminar examines the legal framework for national security decisions. Cadets will analyze the delicate balance of liberty and security that must exist to preserve a democratic society. Particular areas examined include: constitutional separation of powers and shared responsibility for national security; the legality and scope of war and other uses of armed force short of war; access to and protection of sensitive information; intelligence collection and clandestine activities; and the formulation of national security policy and law.

3 Credit Hours

LW488 Business Law

Either Term—Prerequisite: None.
This course introduces the cadet to the basics of business and commercial law. The course provides a survey of legal issues encountered in the business

world, emphasizing contractual principles under the common law and Uniform Commercial Code. Legal issues in the following areas are explored: torts, products liability, landlord-tenant, consumer protection, warranties, real and personal property, insurance, business associations, and employment law. The course includes a survey of the basic principles of government contracting law. This course employs both case-study and problem-solving methods of instruction.

3 Credit Hours

LW490 Special Topics in the Law

Second Term—Prerequisite: Departmental approval. This course is typically taught by a visiting professor. It concerns the particular area of legal expertise of the visiting professor or another departmental professor and therefore changes on an annual basis. For information on the specific topic offered and course requirements, contact the department academic counselor during the fall term.

3 Credit Hours

LW495 Jurisprudence and Legal Theory

Both Terms—Prerequisite: Departmental approval. This course is the capstone for both American Legal Studies and International and Comparative Legal Studies majors at the academy. The course is an advanced seminar in the legal philosophy as applied to contemporary domestic and international issues. The course integrates legal coursework throughout the curriculum and the cadet's respective legal studies major.

3 Credit Hours

LW498 Thesis I: Proposal & Research

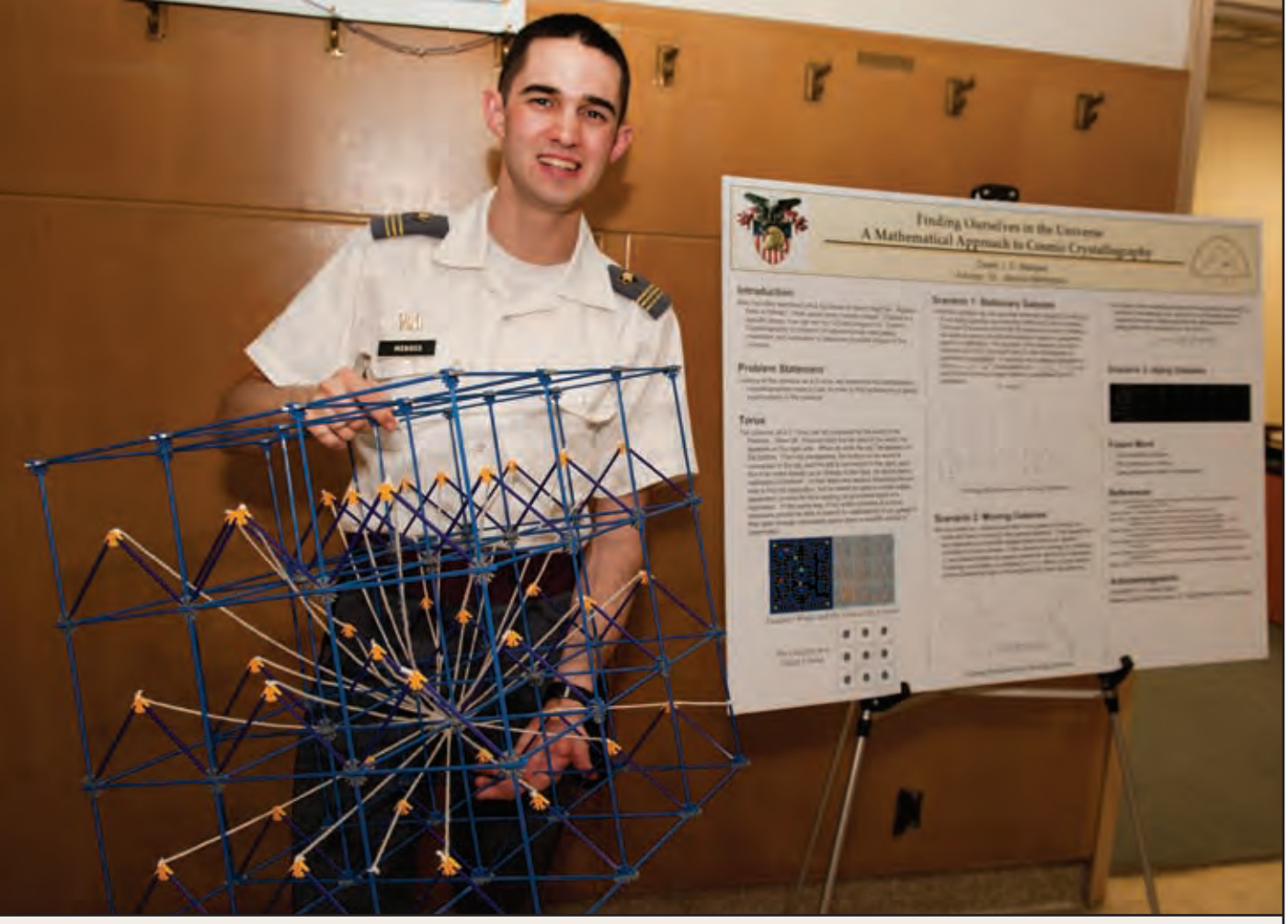
First Term—Prerequisite: Departmental approval. The purpose of the Senior Thesis is to provide cadets with the opportunity to create projects that are academically, professionally, and personally meaningful to them and that reflect their thinking and abilities as developed at West Point and in the Department of Law. Through the scholarly project that results from this course, cadets will be expected to show how they and their work have progressed and that their work is of professional quality. Cadets will choose a faculty advisor with whom they will work over two semesters. In collaboration with the faculty advisor, cadets will explore their chosen areas of law with a goal of producing a project, usually a 30-page paper that is of professional quality. This paper will be completed during LW499. Cadets will meet individually with their advisors on a regular basis to discuss the law, progress on the thesis, and developmental issues.

3 Credit Hours

LW499 Thesis II: Paper & Defense

Second Term—Prerequisite: LW498. This course continues the work on the thesis commenced in LW498. At the end of the course, cadets will submit their theses to the Department of Law and orally defend their theses before a faculty committee.

3 Credit Hours



The Department of Mathematical Sciences provides each cadet the opportunity to gain the mathematical education essential to progressive and continuing development throughout a career as a Regular Army officer. Emphasis is placed on achieving intellectual discipline, mastery of reasoning, understanding of mathematical concepts, skill in practical applications of mathematics, and appreciation for the role of mathematics in the military and society. The core requirement in mathematics is satisfied by successful completion or validation of the standard program. Cadets with weak backgrounds in algebra and trigonometry are required to complete a course in precalculus prior to undertaking the standard program. Building on the foundation of the core mathematics program, analytic and problem-solving skills are developed through a rich variety of electives in mathematics. In addition, the Department of Mathematical Sciences has a major in Mathematical Sciences and, in conjunction with the Department of Systems Engineering, a major in Operations Research.

MATHEMATICAL SCIENCES

Mathematical Sciences Major

The Department of Mathematical Sciences offers a wide range of elective courses that enables cadets to complete either a field of study or a major in the mathematical sciences. Depending on the interest of each cadet, programs of study generally are organized to focus on mathematics of the applied sciences, mathematics of operations research, and mathematics of computation, or statistics.

Operations Research Major

The field of Operations Research evolved from organizations' need to examine the operational characteristics of complex systems involving technology, people, and processes with the intent on making them more efficient and effective. This application of logical thought and quantitative methods provides commanders and managers with a sound basis for decision-making. The focus of study at West Point is on translating requirements into working models, optimization methods, applications of probability and statistics, and various forms of modeling to include simulation. Cadets electing the Operations Research field of study or major must take the Systems Engineering sequence in addition to a host of Operations Research courses designed to provide a required depth of study at the undergraduate level.

MA100 Precalculus Mathematics

Either Term—Prerequisite: None.

This course prepares cadets with background deficiencies in algebra and trigonometry for the core mathematics program. The course develops fundamental skills in algebra, trigonometry, and functions through an introduction to mathematical modeling and problem solving. Since this course does not count toward graduation requirements, cadets enrolled in MA100 will forfeit an elective opportunity.

3 Credit Hours

MA101 Mathematical Modeling and Introduction to Calculus

Second Term—Prerequisite: MA100.

This course continues the study of mathematical modeling and problem solving, using effective problem-solving strategies and modeling theory to solve complex and often ill-defined problems. The course exercises mathematical concepts while nurturing creativity, critical thinking, and learning through activities performed in disciplinary, interdisciplinary, and multidisciplinary settings. Special emphasis is placed on introducing calculus using continuous and discrete mathematics through applied settings. The course exploits a variety of technological tools to develop numerical, graphical, and analytical solutions that enhance understanding. The successful completion of MA100 and MA101 is equivalent to completing MA103.

4 Credit Hours

MA103 Mathematical Modeling and Introduction to Calculus

Either Term—Prerequisite: None.

This course is the first course of the mathematics core curriculum, and it emphasizes applied mathematics through modeling – using effective problem-solving strategies and modeling theory to solve complex and often ill-defined problems. The course exercises mathematical concepts while nurturing creativity, critical thinking, and learning through activities performed in disciplinary, interdisciplinary, and multidisciplinary settings. Special emphasis is placed on introducing calculus using continuous and discrete mathematics through applied settings. The course exploits a variety of technological tools to develop numerical, graphical, and analytical solutions that enhance understanding.

4 Credit Hours

MA104 Calculus I

Either Term—Prerequisite: MA103 or MA101.

This is the second semester of the mathematics core curriculum. This course and Calculus II, the third semester of the mathematics core curriculum, provide a foundation for the continued study of mathematics and for the subsequent study of physical sciences, social sciences, and engineering. Combined coverage includes single and multivariable differential calculus, single and multivariable integral calculus, and differential equations. Throughout both courses mathematical models motivate the study of topics such as optimization, accumulation, change in one and several variables, differential equations, motion in space, and other topics from the natural sciences, the social sciences, and the decision sciences. MA104 covers single and multivariable differential calculus, including three-dimensional geometry and vectors.

4.5 Credit Hours

MA153 Mathematical Modeling and Advanced Calculus I

First Term—Prerequisite: Selection by department head based upon mathematical experiences and abilities.

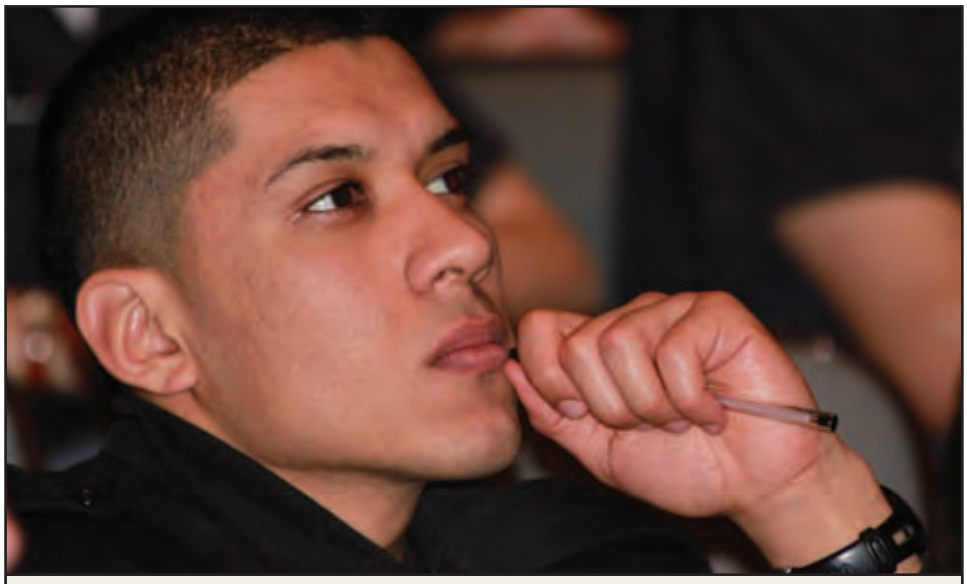
This is the first course of a two-semester advanced mathematics sequence for selected cadets who have validated single variable calculus and demonstrated strength in the mathematical sciences. It is designed to provide a foundation for the continued study of mathematics, sciences, and engineering. This course consists of an advanced coverage of topics in multivariable calculus. Topics may include a study of infinite sequences and series, vectors and geometry of space, vector functions, partial derivatives, multiple integrals, and vector calculus. An understanding of course material is enhanced through the use of a computer algebra system.

4 Credit Hours

MA205 Calculus II

Either Term—Prerequisite: MA104.

This is the third semester of the mathematics core curriculum. This course with Calculus I, the second semester of the mathematics core curriculum, provides a foundation for the continued study of mathematics and for the subsequent study of the physical sciences, social sciences, and engineering. Combined coverage includes single and multivariable differential calculus, single and multivariable integral calculus, and differential equations. Throughout both courses, mathematical models motivate the study of topics such as optimization, accumulation, change in one and several variables, differential equations, motion in space, and other topics from the natural sciences, the social sciences, and the decision sciences. MA205 covers single and multivariable integral calculus



"The greatest good you can do for [students] is not just to share your riches but to reveal to [them their] own."

Benjamin Disraeli

and elementary ordinary differential equations. The sequence culminates with an introduction to the mathematics most applicable to each cadet's major or engineering stem.

4.5 Credit Hours

MA255 Advanced Calculus II

Second Term—Prerequisite: MA153.
This is the second course of a two-semester advanced mathematics sequence for selected cadets who have validated single variable calculus and demonstrated strength in the mathematical sciences. It is designed to provide a foundation for the continued study of mathematics, sciences, and engineering. This course emphasizes the interaction between mathematics and the physical sciences through modeling with differential equations. Topics may include a study of first order differential equations, first order difference equations, second order linear equations, partial differential equations and Fourier series, systems of first order linear equations, numerical methods, and nonlinear equations and stability. An understanding of course material is enhanced through the use of a computer algebra system.

4.5 Credit Hours

MA206 Probability & Statistics

Either Term—Prerequisite: MA205 or MA255.
This is the final course in the mathematics core curriculum. It provides a professional development experience upon which cadets can structure their reasoning under conditions of uncertainty and presents fundamental probability and statistical concepts that support the West Point core curriculum. Coverage includes data analysis, modeling, probabilistic models, simulation, random variables, and their distributions, hypothesis testing, confidence intervals, and simple linear regression. Applied problems motivate concepts, and technology enhances understanding, problem solving and communication.

3 Credit Hours

MA363 Vector Calculus and Ordinary Differential Equations

Second Term—Prerequisite: MA205 or MA255.
This course continues the study of vector calculus from MA205 through the remainder of the vector differential operations, line and surface integrals, and the vector integral theorems of Green, Gauss, and Stokes. The focus then turns to the study of ordinary differential equations. Emphasis is placed upon analyzing a variety of practical applications that give rise to ordinary differential equations. Numerical methods of solution are also studied.

3 Credit Hours

MA364 Engineering Mathematics

Either Term—Prerequisite: MA205 or MA255.
This course provides additional mathematical techniques and deepens the understanding of concepts in mathematics to support continued study in science and engineering. Emphasis is placed upon using mathematics to gain insight into natural and man-made phenomena that give rise to problems in differential equations and vector calculus. Calculus topics focus on three-dimensional space curves, vector fields and operations, divergence and curl, line and surface integrals. Analytic and numerical solutions to differential equations and systems of differential equations are found using a variety of techniques. Linear algebra topics include solutions to homogeneous and non-homogeneous systems of equations. An introduction to classical partial differential equations is included in the spring semester.

3 Credit Hours

MA366 Vector Calculus & Introduction to Partial Differential Equations

Second Term—Prerequisite: MA205 or MA255.
This course provides additional mathematical techniques and deepens the understanding of concepts in mathematics to support continued study in environmental engineering. Emphasis is placed upon using mathematics to gain insight into natural and man-made phenomena that give rise to problems solved through differential equations and vector calculus. Calculus study focuses on vector fields, differential operators, and the vector integral theorems. This material is then used to derive the diffusion equation. Solutions of this equation via Fourier series, separation of variables, and numerical methods are then studied.

3 Credit Hours

MA371 Linear Algebra

Either Term—Prerequisite: MA205 or MA255.
This course emphasizes both the computational and theoretical aspects of linear algebra one encounters in many subjects ranging from economics to engineering. The course covers solutions of linear systems of equations and the algebra of matrices. The foundational aspects of vector spaces and linear transformations to include linear dependence and independence, subspaces, bases and dimension, inner products, least-squares, and orthonormalization are developed. This is rounded out with a detailed investigation of eigenvalues and eigenvectors as they relate to diagonalization, quadratic equations, and systems of differential equations. Applications of the course material are included in the form of special problems to illustrate its extensive utility.

3 Credit Hours

MA372 Introduction to Discrete Mathematics

First Term—Prerequisite: MA206.
The purpose of this course is to introduce topics in discrete mathematics, providing a foundation for further study and application. The topics covered are useful to both the applied mathematician and the computer scientist. They include propositional logic, elements of set theory, combinatorics, relations, functions, partitions, methods of proof, induction and recursion, digraphs, trees, finite state machines, and algebraic systems. Specific applications to computer science are presented.

3 Credit Hours

MA376 Applied Statistics

First Term—Prerequisite: MA206.
This course builds on the foundations presented in the core probability and statistics course to provide a broad introduction to some of the most common models and techniques in applied statistics. The mathematical basis for each of the models and techniques is presented with particular emphasis on the development of the required test statistics and their distributions. Topics covered include hypothesis testing, analysis of variance,

categorical data analysis, regression analysis, and nonparametric methods.

3 Credit Hours

MA381 Nonlinear Optimization

First Term—Prerequisite: MA205 or MA255.
This course provides an undergraduate presentation of nonlinear topics in mathematical programming that builds on multivariable Calculus II. The emphasis of this course is on developing a conceptual understanding of the fundamental topics introduced. These topics include general convexity, convex functions, derivative-based multivariable search techniques, minima and maxima of convex functions, gradients, Hessian matrices, Lagrange Multipliers, Fritz-John and Kuhn-Tucker optimality conditions, and constrained and unconstrained optimization. Current technologies are used to explore and expose various key ideas throughout the course.

3 Credit Hours

MA383 Foundations of Mathematics

First Term—Prerequisite: MA205 or MA255.
This course introduces the cadet to the methods and language of upper-division mathematics. It presents formal set theory and introduces the cadet to the methods of formulating and writing mathematical proofs. Finally, it provides the cadet a rigorous introduction to the theory of relations, functions, and infinite sets.

3 Credit Hours

MA385 Chaos and Fractals

Second Term—Prerequisite: MA205 or MA255.
This course introduces topics in fractal geometry and chaotic dynamical systems, providing a foundation for applications and further study. The topics from fractal geometry include the military applications of image analysis and data storage. The chaotic dynamical systems studied in the course are one-, two-, and three-dimensional, nonlinear, discrete and continuous dynamical systems. Topics include the logistics equation, the Henon attractor, the Lorenz equations, bifurcation theory, Julia sets, and the Mandelbrot set. These topics have applications in many fields of science, and examples from biology, meteorology, engineering, and the social sciences are studied. The course integrates concepts introduced in the core mathematics courses.

3 Credit Hours

MA386 Introduction to Numerical Analysis

First Term—Prerequisites: CS105 and MA205 or MA255.
This course develops an understanding of the methods for solving mathematical problems using a digital computer. Algorithms leading to solution of mathematical problems will be examined for consistency, stability, and convergence. After a brief review of calculus theory, a study of error analysis and computer arithmetic will provide the framework for the study of the following topics: solutions of equations of one variable, solutions of linear and nonlinear systems of equations, the use of polynomials to approximate discrete data, curve fitting, numerical integration and differentiation, and the approximation of continuous functions. Special problems will incorporate computer graphics and the use of mathematical software libraries to produce numerical solutions of applied problems.

3 Credit Hours

MA387 Mathematical Analysis I

Second Term—Prerequisite: MA383.
This is a one-semester course providing a rigorous introduction to the calculus of a single variable. The course is designed to introduce the cadet to the foundations of the calculus necessary for advanced undergraduate and graduate studies in applied mathematics and engineering. Course coverage includes a treatment of the structure of the real number system, sequences, continuous functions, and differentiation.

3 Credit Hours

MA391 Mathematical Modeling

Either Term—Prerequisite: MA205; Pre or Corequisite: MA206.
This course is designed to give cadets the opportunity to develop skills in model construction and model analysis while addressing interesting scenarios with practical applications from a wide variety of fields. The course addresses the complex process of translating real-world events into mathematical language and constructs, solving the resulting mathematical model (iterating as necessary), and interpreting the results in terms of

real-world issues. Topics include model development from data, regression, general curve fitting strategies, and deterministic and stochastic model development. Interdisciplinary projects based on actual modeling scenarios are used to integrate the various topics into a coherent theme.

3 Credit Hours

MA396 Numerical Method Solutions to Differential Equations

Second Term—Prerequisites: CS105 and MA205 or MA255.
The focus of this course is to find numerical solutions of differential equations that result when modeling physical phenomena. The numerical solution of both initial value problems and boundary-value problems that arise with ordinary differential equations are covered. Techniques for solving partial differential equations are introduced. Software packages (Mathematica, Maple, Matlab, etc.) have proved to be very useful tools for many numerical techniques and are used to augment an understanding of course material.

3 Credit Hours

MA461 Graph Theory and Networks

Either Term—Prerequisite: Department approval.
This course introduces the cadet to the techniques, algorithms, and structures used in graph theory and network flows in order to solve real-world discrete optimization problems. Basic definitions relating to graphs and digraphs, together with a large number of examples and applications, are provided. Cadets learn to implement new graph theory techniques in their areas of study. Emphasis is on modeling, algorithms, and optimization.

3 Credit Hours

MA462 Applied Combinatorics

Second Term—Prerequisite: Department approval.
This course introduces the basic techniques and modes of combinatorial problem solving important to the field of computer science and mathematical sciences, such as operations research. Applications of combinatorics are also related to fields such as genetics, organic chemistry, electrical engineering, and political science. Combinatorial enumeration and logical structure are stressed. Applications and examples provide the structure of progression through topics that include counting methods, generating functions, recurrence relations, and enumeration techniques.

3 Credit Hours

MA464 Applied Algebra w/Cryptology

Second Term—Prerequisites: CS105 and MA205 or MA255.
Cadets study the underlying algebra of computer science structures as well as sets, set functions, Boolean algebra, finite state machines, groups, and modular arithmetic. The course introduces mathematical aspects of cryptology with an emphasis on cryptanalysis of encryption ciphers. Cadets also study early paper-and-pencil systems through current computer algorithms for encryption. Algebraic principles are employed in both design and analysis of encryption systems, be it matrix, linear feedback shift register sequence, or linear congruential random number generator sequence efforts. Further investigation is made of the mathematics of breaking machine ciphers and of designing modern public-key crypto systems.

3 Credit Hours

MA466 Abstract Algebra

Either Term—Prerequisite: Department approval.
This is an introductory course in modern algebra for cadets who plan to do graduate work in mathematics or theoretical work in the physical sciences or engineering. The emphasis of the course is on group theory, considering such topics as cyclic and abelian groups, normal sub-groups and factor groups, series of groups, and solvable groups. Selected applications are interspersed with the material on group theory. The course concludes with an introduction to rings and fields. One special problem is provided to allow the cadet to do independent research in an area of the cadet's interest.

3 Credit Hours

MA476 Mathematical Statistics

Second Term—Prerequisite: MA206.
This course builds on the foundation presented in the core probability and statistics course to provide a mathematical presentation of the important topics in mathematical statistics. The course begins with a review of probability concepts from the core course, adding additional topics such as transformations of random variables and moment generating functions. To provide the mathematical basis for much of statistical practice, certain limit theorems and sampling distributions are proven. The central focus of the course is distribution theory, to include the theory of estimation and the theory of hypothesis testing.

3 Credit Hours

MA481 Linear Optimization

Second Term—Prerequisite: MA371.
This course emphasizes the applications of optimal solutions to linear algebraic systems using the simplex method of linear programming. This includes an in-depth development of the simplex method, the theory of duality, an analysis of the dual problem, convex hull concepts, integer programming, sensitivity analysis, and the revised simplex procedure. Additional computational techniques that are applicable to specific mathematical models, such as the transportation problem, assignment problem, and network problems, are also studied. Problems illustrating applications are emphasized throughout the course. Use of current technologies to solve problems is also emphasized.

3 Credit Hours

MA484 Partial Differential Equations

First Term—Prerequisite: MA205 or MA255.
The course is devoted to the solution of the classical partial differential equations of mathematical physics and most engineering fields. For example, these equations describe such diverse phenomena as the flow of heat in a metal plate, the gravitational field of the solar system, the vibration of a structural beam, and the energy levels of the hydrogen atom. The subject matter has application in many fields and should be of interest to mathematics, science, and engineering concentrators. Specific topics covered are the heat, wave, and potential equations; Fourier series; series solutions to ordinary differential equations; special functions; and boundary value problems.

3 Credit Hours

MA485 Applied Complex Variables

Second Term—Prerequisite: MA205 or MA255.
This course presents a logical development of complex variable theory sufficient for the development and solution of a number of interesting and practical problems. Residue theory is developed and applied to problems in integration and in the solution of partial differential equations via transform techniques. Conformal mapping theory is used to solve partial differential equations for which the solution is a harmonic function satisfying prescribed boundary conditions. These classical Dirichlet-Neumann problems model phenomena arising in the study of electrostatic potential, equilibrium thermodynamics, incompressible fluids, elasticity, and other areas of continuum mechanics.

3 Credit Hours

MA487 Mathematical Analysis II

First Term—Prerequisite: MA387.
This course is a continuation of MA387. Course coverage includes Riemann and Stieltjes integration, infinite series, sequences and series of functions, uniform convergence, and power series.

3 Credit Hours

MA488 Special Topics in Mathematics

Either Term—Prerequisite: Department approval.
This course provides an in-depth study of a special topic in mathematics not offered elsewhere in the West Point curriculum. Course content will be based on the special expertise of the visiting professor or a senior mathematical science faculty member. Special requirements: To be determined by the course director.

3 Credit Hours

MA489 Advanced Individual Study in Mathematics

Either Term—Prerequisite: Department approval.
This is essentially a tutorial course or an individual project offered to a limited number of highly qualified cadets who have the knowledge and desire to pursue advanced study in a specific field of mathematics. The course work will be tailored to suit the individual needss.

3 Credit Hours

MA490 Applied Problems in Math, Science, & Engineering

Second Term—Prerequisite: Completion of mathematics core curriculum.
This course is intended to serve as an integrative experience for cadets of all majors. Cadets, having completed the core mathematics program, will be given the opportunity to develop skills in model construction and analysis while addressing problems and scenarios with practical applications from science, social sciences, engineering, computer science, and/or mathematics. Interdisciplinary projects based on actual modeling scenarios are used to integrate the various topics into a coherent theme.

3 Credit Hours

MA491 Research Seminar in Applied Mathematics

Second Term—Prerequisite: MA391 or consent of course director.
The cadet integrates the mathematical concepts and techniques learned in previous courses with the principles developed throughout the entire West Point curriculum to solve a current problem of interest to the cadet, to the academy, or to agencies in the Department of Army. Cadets may select problems from a list of suitable projects provided by the Department of Mathematical Sciences. Cadets select a faculty advisor who has an interest and background in the problem. Cadets may work individually or in small teams, depending on the nature of the research. Regular workshop sessions will be held. Cadets will be given an opportunity to present their research at the Service Academies Cadet Mathematics Conference and/or other undergraduate conferences. Research reports will be reviewed, edited, and compiled into the USMA Transactions on Cadet Mathematical Research.

3 Credit Hours

The Department of Physics and Nuclear Engineering offers core courses designed to be relevant to the modern military, promote scientific literacy as preparation for commissioned service, prepare logical and creative thinkers skilled in problem solving, and serve the essential needs of several academic disciplines. In addition to classical mechanics and electromagnetic interactions, topical coverage includes fundamentals of nuclear energy, lasers, optics, and the interactions of radiation with matter. Every cadet takes this two-semester, calculus-based, core physics sequence during the sophomore year. Cadets interested in physics may select a major in either Physics or Basic Science. The department's Nuclear Engineering Program offers a three-course core engineering sequence in nuclear engineering, a Nuclear Engineering major, and a Nuclear Engineering Science major.

PHYSICS & NUCLEAR ENGINEERING

Physics Major and Basic Science Major

The Physics major is designed to equip graduates with knowledge of scientific principles and experimental techniques that will prepare them to lead Army science and technology efforts in the future. The major includes a thorough grounding in the fundamentals of theoretical physics that prepares cadets for the possibility of future graduate studies. The Department of Physics and Nuclear Engineering also sponsors, jointly with the Department of Chemistry and Life Science, a Basic Science major. This major offers a great deal of flexibility within the three scientific disciplines offered by the departments. Interested cadets meet with a department counselor to choose a slate of 10 courses, within certain guidelines, that best fits their educational goals and needs.

Core Sequence in Nuclear Engineering

The Department of Physics and Nuclear Engineering offers a three-course sequence in nuclear engineering taken by non-engineering cadets to fulfill the core requirement for engineering science and design. The sequence teaches cadets to apply nuclear science and engineering skills in the application of nuclear energy, neutronics, thermal-hydraulics, power production, safety, economics, nuclear weapons, and weapons effects.

Nuclear Engineering Major and Nuclear Engineering Science Major

The Nuclear Engineering major (NEN0) is designed to provide depth of knowledge in the application of nuclear energy, including power production, radiation health physics, nuclear weapons, and weapons effects. The major is taught through multiple departments and includes 17 interdisciplinary courses from physics, mathematics, mechanical engineering, civil engineering, electrical engineering, and nuclear engineering. The NEN0 major is accredited by the Engineering Accreditation Commission of ABET, www.abet.org. The Nuclear Engineering Science major provides depth of knowledge in the application of nuclear energy, however, not as much depth as in the Nuclear Engineering major. The Nuclear Engineering Science major is taught through multiple departments and includes 13 interdisciplinary courses from physics, mathematics, mechanical engineering, civil engineering, electrical engineering, and nuclear engineering.

The nuclear engineering cadet will gain a broad background for further study in graduate school and Army assignments requiring expertise in nuclear engineering, civil and mechanical engineering, applied radiation physics, nuclear weapons and weapons effects, or any of a variety of related fields. The goal of the nuclear engineering program is to provide the cadet with high-quality instruction in a positive learning environment that fosters the development of critical thinking skills, and a fundamental understanding of three educational threads interwoven throughout the program: experimental (hands-on), engineering design, and computational threads. The graduate is well-prepared to excel as an officer and an engineer and

to address complex technical problems in a rapidly changing, high-technology Army.

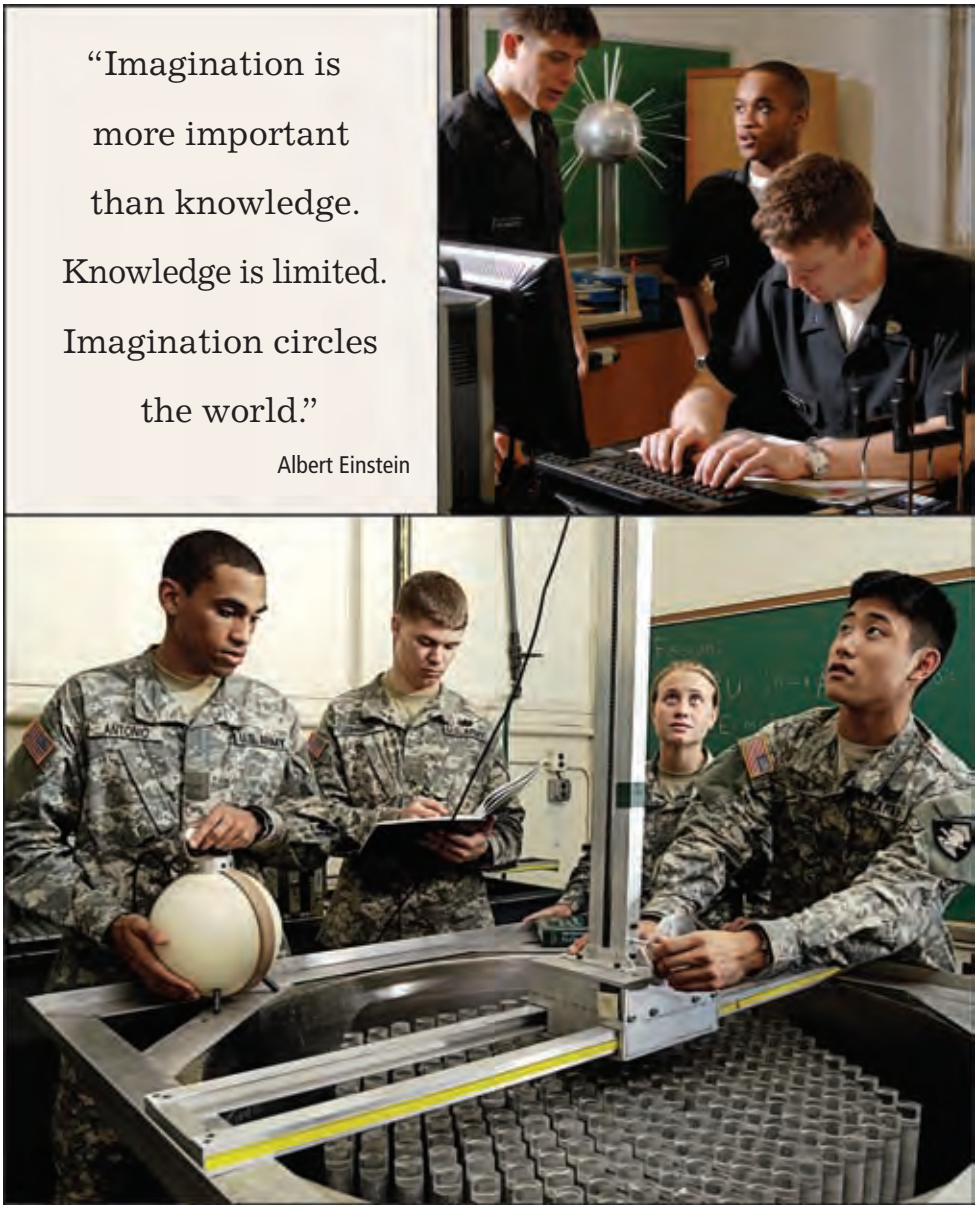
Graduates who major in nuclear engineering:

1. As Army leaders, solve complex, multi-disciplinary problems for the Army and the nation.
2. Demonstrate the necessary leadership and teamwork skills to work in multi-disciplinary team environments.
3. Are prepared to provide appropriate nuclear and radiological engineering expertise to the Army.
4. Communicate effectively, orally and in writing.
5. Continue to grow intellectually and professionally as Army officers and as engineers.

PH201 Physics I

First Term—Prerequisites: MA103 and MA104 or equivalent. Corequisite: MA205.
This is the first course of a two-semester, calculus-based physics sequence. This course consists of an introduction to nuclear physics and a comprehensive study of classical mechanics, which is designed to promote scientific literacy and to develop the use of scientific modes of thought to solve complex problems. Topics include a survey of nuclear physics and a detailed study of the laws of motion, conservation of energy, and conservation of momentum. An integrated laboratory program illustrates basic scientific techniques and serves to stimulate intellectual curiosity. The core physics program is designed to demonstrate the relevance of physics to military technology and to help prepare future Army leaders to anticipate and adapt to technological change. For selected cadets with demonstrated strengths in mathematics and science, PH251 offers an accelerated and more thorough study of the PH201 course.

3.5 Credit Hours



PH202 Physics II

Second Term—Prerequisite: PH201.
This is the second course of a two-semester, calculus-based physics sequence. It consists of a comprehensive study of electromagnetism and optics designed to promote scientific literacy and to develop the use of scientific modes of thought to solve complex problems. Topics include a detailed study of electrostatics, magnetism, circuits, geometric optics, and wave optics. An integrated laboratory program illustrates basic scientific techniques and serves to stimulate intellectual curiosity. The core physics program is designed to demonstrate the relevance of physics to military technology and to help prepare future Army leaders to anticipate and adapt to technological change. For selected cadets with demonstrated strengths in mathematics and science, PH252 offers an accelerated and more thorough study of the PH202 course.

3.5 Credit Hours

PH361 Experimental Physics

First Term— Prerequisite: PH202 or PH252. Corequisite: PH365.
This course provides instruction and experimental experiences designed to exercise the cadet's knowledge of classical and modern physics and to extend his or her familiarity with equipment and techniques used in a physical science laboratory. Cadets, working in groups, execute and report on experimental projects. The program of instruction includes familiarization with mechanical design, electronics and instrumentation, data analysis, and laboratory procedures and practices. Knowledge and skills acquired in this course are essential for subsequent laboratory work in solid state physics, nuclear physics, and optics.

3.5 Credit Hours

PH363 Mathematical Physics

First Term—Prerequisites: PH204 and MA205 or equivalents.
This course introduces the physics major to the methods and foundations of mathematical physics. Topics covered include ordinary differential equations, Sturm-Liouville theory, orthogonal functions, the partial differential equations of classical and quantum physics, and integral transforms. Mathematical methods are taught in the context of physical modeling.

3 Credit Hours

PH365 Modern Physics

First Term—Prerequisite: PH202 or PH252.
This course introduces special relativity and the fundamental concepts of quantum physics with application to atomic physics and nuclear physics in order to prepare cadets for advanced study of science and engineering, especially quantum mechanics, statistical physics, nuclear physics, laser physics, medical radiation physics, and nuclear engineering. This course will also be of interest to any cadet who wishes to gain a deeper appreciation of the natural world or of the technology of the 21st century.

3 Credit Hours

PH366 Applied Quantum Physics

Second Term—Prerequisites: PH361 and PH484.
This course uses the experimental and laboratory skills developed in PH361 to explore the applications of the 20th century developments studied in PH365. The topics covered will vary but may include molecular structure, the properties of solids including metals and semiconductors, nuclear physics, and elementary particle physics.

3.5 Credit Hours

PH381 Intermediate Classical Mechanics

Second Term—Prerequisite: PH363.
This course continues the development of physical principles introduced in the core physics curriculum. Direct application of Newton's laws is used to analyze phenomena such as projectile motion with air resistance, charged particle motion, and motion in a central force field. Harmonic, driven, and damped oscillations are studied in depth, as are systems of coupled oscillators. The formalism of Lagrangian mechanics is studied in depth. The mathematical tools of classical mechanics are introduced, to include vector fields, line integrals, the calculus of variations, linear algebra, and eigenvalue equations. Cadets will be required to develop and demonstrate the ability to use a computer algebra system to solve advanced problems and plot the solutions.

3 Credit Hours

PH382 Intermediate Electrodynamics

Second Term—Prerequisite: PH363.
This course continues the study of classical electrodynamics introduced in the introductory physics sequence by developing the differential forms of the Maxwell equations and applying them to boundary value problems in two and three dimensions. In addition, scalar and vector potentials are introduced; multipole field expansions are developed for complex sources; electromagnetic fields in dielectric and magnetic media are studied; the propagation of electromagnetic waves in conducting and non-conducting media is considered, and electromagnetic radiation is introduced. The course concludes with the study of the connection between special relativity and electrodynamics. This course provides an essential foundation for courses in optics, lasers, quantum mechanics, statistical mechanics, and solid state physics.

3 Credit Hours

PH389 Individual Study in Physics

First or Second Term—Prerequisite: PH202 or PH252.
This course is an individually supervised research and study program to familiarize cadets with advanced scientific procedures and techniques. The primary purpose is to acquaint cadets with the essential skills required for independent research

in physics. With the approval of the head of the department, the cadet chooses a research project of interest and is supervised by a faculty member conducting the research.

1.5 Credit Hours

PH456 Science and Policy

Second Term—Prerequisite: None.
This course challenges cadets to draw upon their core academic experience to analyze complex policy issues. The relationship and interaction among social, political, economic, and technological dimensions of these issues are explored. Emphasis is given to gaining an understanding of both the power and limitations of science and scientific thinking when confronting problems in the policy arena.

3 Credit Hours

PH472 Space and Astrophysics

Second Term—Prerequisite: PH202 or PH252.
This course is an introduction to two related, but not identical, disciplines of physics: space physics and astrophysics. Space physics is concerned with understanding the environment between the sun and the Earth's upper atmosphere. Coronal mass ejections, the solar wind, magnetospheric storms, and auroral precipitation are among the many phenomena studied in the context of space physics. Astrophysics is a study of stellar structure and evolution, galactic structure, and cosmology. Phenomena of interest include quasars, black holes, supernovas, and the cosmic microwave background radiation. The relative emphasis given to the two disciplines varies depending on the background of the instructor.

3 Credit Hours

PH477 Lasers and Optics

First Term—Prerequisites: PH361 and PH365. Corequisite: PH382.
This course provides intermediate development in the concepts of geometric, wave, and quantum optics and their applications to laser systems. Primary coverage includes common optical devices, light transmission through optical media, diffraction, interference, and polarization. This course then provides a combined theoretical and experimental investigation into the realm of coherent optical radiation generation, amplification, propagation, and application. Cadets apply the basic principles of electromagnetism, optics, and modern physics to analyze specific laser systems, and experiments are performed to demonstrate properties of specific optical and laser systems. The theory of laser gain and amplification is investigated using semi-classical methods.

3.5 Credit Hours

PH481 Statistical Physics

Second Term—Prerequisites: PH484 and MA206.
This course applies basic concepts of probability and statistics to systems consisting of a large number of particles to determine measurable macroscopic quantities such as temperature, pressure, energy, and heat capacity. Emphasis is placed on the calculation of the canonical and grand canonical partition functions for various model physical systems. Particular attention is focused on three ideal gas systems: a gas consisting of massive Maxwell-Boltzmann particles, a gas consisting of massless bosons (i.e., photons), and a gas consisting of fermions.

3 Credit Hours

PH482 Advanced Classical Mechanics

First Term—Prerequisite: PH381.
This course continues the development of concepts introduced in PH381. Hamiltonian mechanics is explored using the calculus of variations to provide a foundation for connecting classical mechanics, quantum mechanics, and statistical mechanics. The two-body central force problem, the mechanics of rotating systems, and scattering theory are studied in depth. The mathematical techniques associated with cylindrical, spherical, and curvilinear coordinates are introduced, as are the basic principles of nonlinear dynamics and chaos. Cadets will be required to develop and demonstrate the ability to use a computer algebra system to solve advanced problems and plot the solutions.

3 Credit Hours

"Knowledge is the only instrument of production that is not subject to diminishing returns."

J. M. Clark

PH484 Quantum Mechanics

Second Term—Prerequisites: PH365 and PH363.
This course begins with a basic introduction to the fundamental postulates of quantum theory. These postulates are then used to develop Heisenberg's uncertainty principle and Schroedinger's equation. Solutions to Schroedinger's equation are sought, first for relatively simple systems such as square wells and harmonic oscillators, and then for the hydrogen atom. The properties of the hydrogen atom are studied in detail. The course also covers approximation methods used for physical systems with small perturbing forces acting on them.

3 Credit Hours

PH489 Advanced Individual Study in Physics

First or Second Term—Prerequisites: PH365, PH361, and permission of the head of department.
This course is an individually supervised research and study program to familiarize students with advanced scientific procedures and techniques. The primary purpose is to acquaint cadets with the essential features of independent research in physics. With the approval of the head of the department, the cadet chooses a research project currently in progress in the department, and is supervised by a faculty member conducting the research.

3 Credit Hours

PH489A Advanced Individual Study in Physics

Second Term—Prerequisites: PH365 and PH489.
This course is a second course in an individually supervised research and study program to familiarize cadets with advanced scientific procedures and techniques. The primary purpose is to foster the cadet's continued development of the essential features of independent research in physics. With the approval of the head of the department, the cadet continues with a research project currently in progress in the department and is supervised by a faculty member conducting the research.

3 Credit Hours

PH495 Special Topics in Physics

Second Term—Prerequisite: None.
This course is taught by the Class of 1967 Endowed Chair or another faculty member who is not occupying an authorized USMA position, including any visiting scholar with a distinguished record of academic and professional achievement in the field of engineering, science, and technology. The Special Topics in Physics course focuses on topical issues that reflect the technical expertise of the chair or visiting scholar. Cadets will apply math, science, and engineering fundamentals they have learned to these studies.

3 Credit Hours

NE300 Nuclear Reactor Analysis

Both Terms—Prerequisite: PH202 or PH252.
This course provides the student with an understanding of the fundamental physical principles involved in nuclear fission and the operation of nuclear reactors. Starting with a brief study of relevant topics from modern physics, the course covers neutron interactions with matter, fission, diffusion, neutron moderation, and criticality of various reactor types. This course is essential for the nuclear engineer and is an excellent choice for the applied scientist.

3 Credit Hours

NE350 Nuclear Reactor Design

Both Terms—Prerequisite: NE300.
This course focuses on nuclear reactor systems, the release of nuclear energy in the reactor core, and its removal as heat for producing electric power. Specific topics emphasize reactor kinetics, heat transfer within the reactor, and control and design of the reactor core. Design projects apply the concepts presented in this course to the solution of practical problems.

3 Credit Hours

NE355 Advanced Nuclear Reactor Design

Second Term—Prerequisite: NE300.
This course is an advanced version of the Nuclear Engineering Core Sequence course NE350. This course focuses on nuclear reactor systems, the release of nuclear energy in the reactor core, and its removal as heat for producing electric power. Specific topics emphasize reactor kinetics, heterogeneous reactors, control rods and shim, reactor poisons, heat transfer, and control and design of the reactor core. The fundamentals of transport theory and the solution to the transport equation using Monte Carlo N-Particle (MCNPX) transport code are introduced. Design projects apply the concepts presented to practical problems.

3.5 Credit Hours

NE374 Medical Radiation Physics

Second Term—Prerequisite: NE300.
This course focuses on fundamental radiation interactions, biological effects of ionizing radiation, radiation dosimetry, elements of shielding, and medical imaging techniques. Specific topics emphasize radiation transformations, kinetics and particle interactions, early and late biological effects of radiation, exposure and dose calculations, radiation safety regulations, x-rays and computed tomography, nuclear imaging, and special topics in medical physics.

3 Credit Hours

NE389 Individual Study in Nuclear Engineering

First or Second Term—Prerequisite: None.
This course is an individually supervised research and study program to familiarize cadets with advanced nuclear or radiological engineering procedures and techniques. The primary purpose is to acquaint cadets with the essential skills required for independent research in nuclear or radiological engineering. With the approval of the head of the department, the cadet chooses a research project of interest and is supervised by a faculty member conducting the research.

1.5 Credit Hours

NE400 Nuclear Engineering Seminar

Second Term—Prerequisite: None.
This seminar will meet once each week and will include all First Class cadets majoring in nuclear engineering. The seminar topics will address the concerns of professional nuclear engineers such as engineering ethics, economics, and licensing procedures. Guest lectures will discuss topics of current interest in the field of nuclear engineering to include DoD initiatives in FA52 (nuclear and counterproliferation.) Much of the seminar material will be presented by guest lecturers from the military, industrial, and academic communities.

1 Credit Hour

NE450 Nuclear Weapons Effects

Both Terms—Prerequisite: NE300.
The course focuses on ionizing radiation, nuclear weapons design, and nuclear weapons effects. Specific topics emphasize the design fundamentals of nuclear weapons (fission and fusion bombs), the interaction of radiation with matter, biological effects of radiation, dirty bombs, and calculating and understanding nuclear weapons effects such as: blast effects, thermal radiation effects, radiation and fallout effects, and electromagnetic pulse effects.

3 Credit Hours

NE452 Instrumentation and Shielding

First Term—Prerequisite: NE300.
This course focuses on nuclear instrumentation and radiation detectors, and on biological and material radiation protection through shielding. Specific topics include a study of radiation, and radiation detection devices to include: ionization chambers, proportional counters, Geiger-Mueller counters, scintillation detectors, semiconductor diode detectors, germanium and sodium iodide gamma-ray detectors, and neutron detectors. Radiation shielding, as a force protection measure, includes the design, analysis, and confirmation of radiation shields using point kernel and removal diffusion methods. Emphasis is placed on practical application of the radiation-detection instruments and the associated acquisition software.

3.5 Credit Hours

NE489 Advanced Individual Study in Nuclear Engineering

First or Second Term—Prerequisites: PH365 and NE355.
This course is an individually supervised research and study program to familiarize cadets with advanced nuclear or radiological engineering procedures and techniques. The primary purpose is to acquaint cadets with the essential features of independent research in nuclear or radiological engineering. With the approval of the head of the department, the cadet chooses a research project currently in progress in the department and is supervised by a faculty member conducting the research.

3 Credit Hours

NE495 Advanced Nuclear System Design Project I

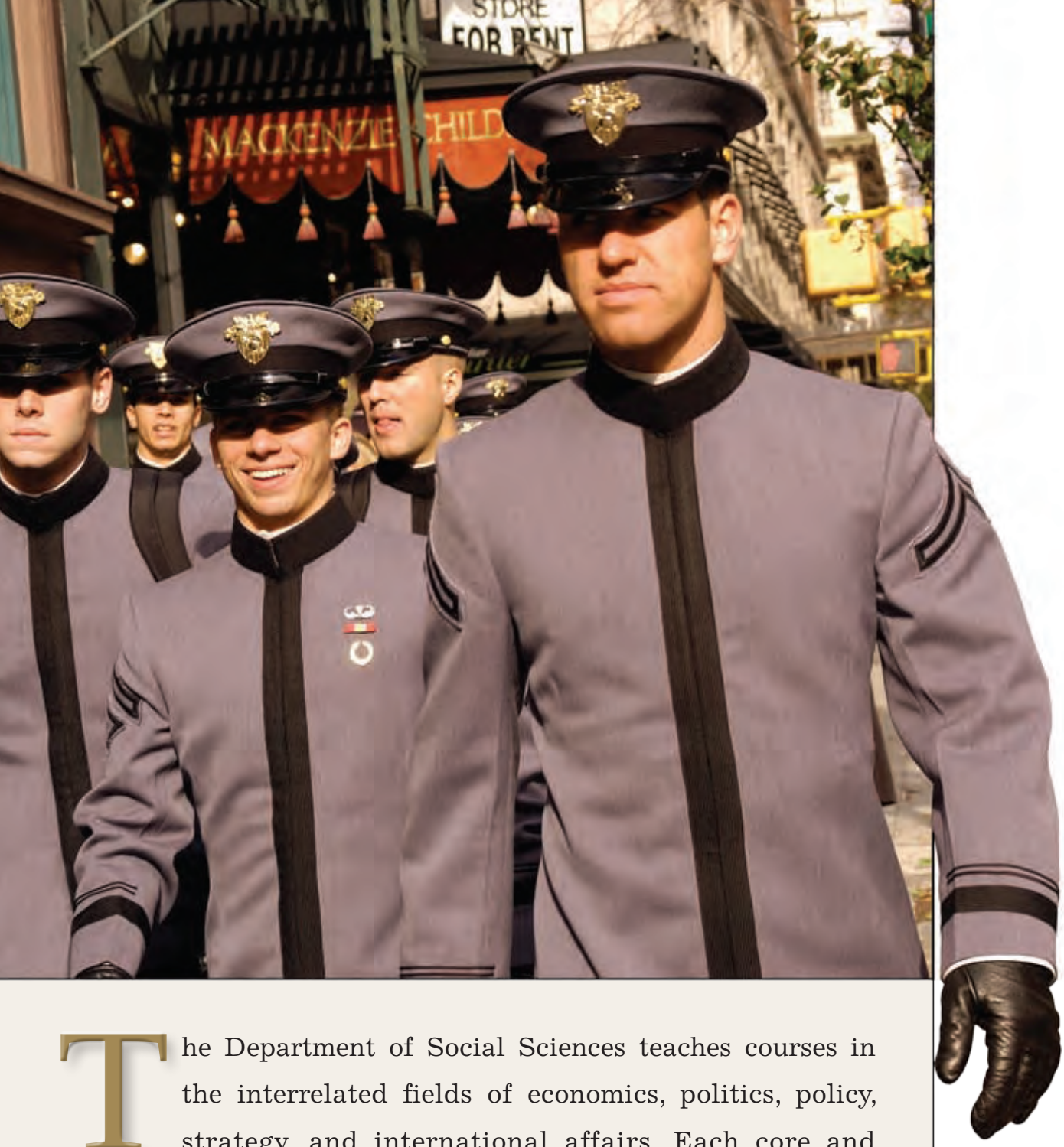
First Term—Prerequisite: Permission of the department head.
This is the first course in a two-semester capstone design experience. The course provides experience in the integration of math, science, and engineering principles into a comprehensive nuclear system design project. The design project emphasizes a multidisciplinary approach to total system design providing multiple paths to a number of feasible and acceptable solutions that meet the stated performance requirements. Design teams are required to develop product specifications, generate alternatives, make practical engineering approximations, and perform appropriate analysis to support the technical feasibility of the design, make decisions leading to an optimal system design, and brief their interim results during in-process reviews (IPRs). Topics such as engineering economics are introduced. Computational codes such as MCNP and other nuclear industry codes specific to the project will be introduced.

3.5 Credit Hours

NE496 Advanced Nuclear System Design Project II

Second Term—Prerequisite: NE495.
This is the second course in a two-semester capstone design experience. The course provides experience in the integration of math, science, and engineering principles into a comprehensive nuclear system design project. The design project emphasizes a multidisciplinary approach to total system design providing multiple paths to a number of feasible and acceptable solutions that meet the stated performance requirements. Design teams are required to develop product specifications, generate alternatives, make practical engineering approximations, and perform appropriate analysis to support the technical feasibility of the design, make decisions leading to an optimal system design, and brief their interim results during in-process reviews (IPRs). During this course, the design project is completed and presented to the project sponsor.

3 Credit Hours



The Department of Social Sciences teaches courses in the interrelated fields of economics, politics, policy, strategy, and international affairs. Each core and elective course endeavors to give cadets a basic understanding of the subject matter, to present a methodology for solving real-world problems, and to indicate the relevance of the course material to the cadet's future duties and responsibilities as a citizen and an officer.

All Third Class cadets are required to pass or validate SS201 Economics: Principles and Problems, and SS202 American Politics. Second Class cadets are required to pass or validate SS307 International Relations. The Department of Social Sciences offers majors in Economics; Comparative Politics; International Relations; and American Politics, Policy & Strategy, and a minor in Terrorism Studies. The department also supports the interdisciplinary fields of Foreign Area Studies and Management.

Economics Major

This field provides insights into the basic social questions of what a society should produce, how that output can be produced most efficiently, and how the output should be distributed. The field includes required courses on the national economy, decision-making by firms and individuals, and applications of economic principles to national security issues.

In addition, there are courses on international trade, comparative economic systems, accounting, managerial economics, and financial institutions. In each course, the emphasis is on the development of principles that can be applied to help resolve important public policy issues.

The Economics major supports graduate study in the social sciences in general, with particular relevance to economics, operations research, engineering management, business administration, and domestic and international affairs. Cadets who meet GPA requirements and complete two additional courses, including a thesis, qualify for the major with honors.

Political Science Majors

Cadets studying political science take electives that introduce them to the methods, theories, and scope of the discipline. Within their elective program, cadets select courses that focus their studies in one of three fields: American, comparative, or international politics.

American Politics, Policy, & Strategy

These electives examine American political traditions and the philosophical origins of American politics, political Institutions, decision-making processes, and public policy. Cadets learn to research and analyze political phenomena by focusing on the domestic political environment.

Comparative Politics

These electives examine political questions from a cross-cultural perspective. Cadets learn about the nature and importance of political institutions by studying them in a variety of environments and regions. Two main questions in this field are: "What causes stability or instability with states?" and "What factors determine a state's regime type?"

International Relations

Courses in this field focus on two central questions: "Why do states act the way they do?" and "How do international relations reflect cooperation and conflict?" Cadets learn theories of international behavior and examine the impact of domestic institutions and problems on international relations. Courses address both historical patterns of relations and current issues of cooperation and conflict in the international system.

The political science major supports graduate study in the social sciences in general, with particular relevance to international affairs, public policy/administration, area studies, and conflict resolution. Cadets who meet GPA requirements and complete two additional courses, including a thesis, qualify for the major with honors.

Standard Courses

SS201 Economics—Principles/Problems

Either Term—Corequisite: MA104. Advanced version (SS251) offered to selected cadets.

This standard course presents the basic principles of economic analysis and their application to contemporary economic problems and supports the further study of economics and related disciplines in the social sciences. The course is organized into three general sections: microeconomics, outlining basic theory of allocation by supply and demand in a market economy and relating this theory to contemporary issues; macroeconomics, surveying the theory of aggregate economics and illustrating the application of macroeconomic theory to public policy in the American economy; and international economics, introducing trade theory and international monetary theory and policy, and application of economics to selected public policy issues (taxation and resource allocations, provision of public goods, etc). Cadets examine the implications of economics on national security and defense, and the use of economic analysis to improve decisions they will make as Army officers.

3.5 Credit Hours

SS202 American Politics

Either Term—Prerequisite: None. Advanced version (SS252) offered to selected cadets.

This course introduces cadets to the fundamentals of American politics and to contrasting theoretical views of American democracy. The thematic focus of the course rests in the two questions "who governs?" and how democratic is America. The course begins with a study of the constitutional foundations of American government and then examines political participation, political institutions, and policymaking processes. Emphasis is placed on the theoretical interpretation of political phenomena. Most classes are conducted as seminars, with a few sessions devoted entirely to lecture. Guest lecturers and simulations supplement in-class work.

3.5 Credit Hours

SS251 Advanced Economics

Either Term—Prerequisite: MA104; substitute for SS201. Enrollment requires approval of the course director.

This advanced version of SS201 presents the basic principles of economic analysis with a greater focus on their application to contemporary economic problems. The course is organized into three general sections: Microeconomics, outlining basic theory of allocation by supply and demand in a market economy and relating this theory to contemporary issues; Macroeconomics, surveying the theory of aggregate economics and illustrating the application of macroeconomic theory to public policy in the American economy; and International Economics, introducing trade theory and comparative advantage. Cadets examine and present their analyses of the implications of economics on national security, defense, including current policy issues, and learn the use of economic analysis to improve decisions they will make as Army officers.

3.5 Credit Hours

SS252 Advanced American Politics

Either Term—Prerequisite: Substitute for SS202. Enrollment requires approval of the course director.

This course provides selected students the opportunity to examine political power, political organization, and political action. The structure of the course is similar to that discussed in SS202, listed above. Cadets will learn how political scientists analyze the events and behaviors called "politics" using theoretical perspectives. Cadets will sharpen their critical thinking and writing skills through a research project, case studies, and class presentations.

3.5 Credit Hours

SS307 International Relations

Either Term—Prerequisites: SS202/SS252. Corequisites: SS201/SS251. Advanced version (SS357) offered to selected cadets.

NOTE: Cadets normally take this course during their third year. With a waiver, approved by the head of the Social Sciences Department, some cadets may take this class in their fourth year.

The objectives of this course are to provide cadets with an introduction to the fundamental concepts of international politics and the analytical tools necessary to evaluate "why states do what they do." In accomplishing these objectives, SS307 builds

upon a cadet's prior academic training in history, English and philosophy, economics, and political science. Emphasizing intellectual pluralism, SS307 focuses on the value of self-consciously applying different theoretical perspectives to international events to obtain improved understanding. Cadets examine key issues such as the consequences of anarchy, the need for security, the role of power, the use of force, international trade and markets, alternative political philosophies, foreign policy-making, and the influence of culture in international affairs.

3.5 Credit Hours

SS357 Advanced International Relations

Either Term—Prerequisite:s SS202/SS252. Corequisite: SS201/SS251. Enrollment requires approval of the course director.

This advanced version of SS307 the study of the fundamental concepts of international politics and the analytical tools necessary to evaluate "why states do what they do" with a more in-depth focus on their application to current international events. SS357 also introduces cadets to a wider range of theoretical approaches and applications. Emphasis is on rigorous, critical analysis and classroom discussion.

3.5 Credit Hours

SS360 Political Analysis

Either Term—Corequisites: SS307/SS357.

This course is an introduction to the methods and techniques of research in contemporary political science. It is designed to improve cadets' ability to think critically about politics. This course differs from many other courses in its emphasis on building critical thinking skills rather than mastering specific facts and theories. The most important of these skills are inference and causal reasoning. Rather than simply accepting "expert" answers to fundamental questions of political life, cadets will learn how to critically evaluate previous answers offered by others. Much of this course is devoted to practical exercises in which cadets put various research methods to work to answer important questions relevant to the field of political science. The course covers the philosophy of science, experimental method in the social sciences, quantitative analysis, and survey research.

3 Credit Hours

SS364 Game Theory

Second Term—Prerequisites: MA206 and SS307/SS357.

Game theory is designed to provide cadets with the tools necessary to think through the various courses of action available as they face uncertain situations, determine market reaction to each alternative, identify the costs and benefits of each course of action, and select the course of action that minimizes cost while maximizing benefits. The purpose of this course is to introduce cadets to the application of strategic thinking to tactical scenarios. This course consists of two components that are taught concurrently. The first component is the introduction of basic game theory, and the second component is the application of those theories to tactical and strategic choice scenarios.

3 Credit Hours

SS366 Comparative Politics

Either Term—Prerequisites: SS202/SS252. Corequisite: SS307.

The objectives of this course are to analyze the sources of stability or instability in political regimes and to examine the conditions that promote either democracy or dictatorship. Our first task is to describe different regimes: What do we mean when we call one democratic and another authoritarian? We approach this first task by building a regime model. As we do so, we seek to understand what makes political regimes stable or unstable by analyzing their effectiveness, popular legitimacy, and institutional adaptability. All regimes are challenged by change, but some remain stable in the face of change, while others are transformed. Why? And is it possible to argue that there is a "best" type of regime? Are there universally valid criteria – across time and space – that we can use to compare regimes? Why do regimes succeed, fail, and change? As well as being central to the discipline of political science, these questions also play an important role in world politics and the formulation of U.S. foreign policy. Since we are both students of political science and professionals who will serve as policy executors, the study of comparative politics offers significant rewards. After building the model, we take it through various regions of the world using the comparative method, analyzing the variables that change from regime to regime in liberal democracies, communist and post-communist states, newly industrializing and less-developed countries, and the Islamic world.

3 Credit Hours

SS368 Econometrics 1

Either Term—Prerequisite: MA206.

This course teaches cadets how to quantify, test, and employ economic theories as they are used in real-world applications. The course covers the use of economic theory and data in the construction, estimation, and interpretation of econometric models. Special emphasis is placed on estimation of parameters of economic models and statistical inference using estimated models to determine the validity of economic theories. The primary mathematical tool employed in the course is multiple regression analysis. A number of applications demonstrate the use of the techniques studied.

3 Credit Hours

SS370 Mass Media and American Politics

Either Term—Prerequisites: SS202/SS252.

This seminar introduces cadets to what is perhaps the single most influential private institution in the American political system – oftentimes referred to as the "fourth branch" or "fourth estate" of American government. The mass media, to include newspapers, television journalism, radio, the arts, and the internet, receive both theoretical and practical inquiry. In particular, the roles, motivations, and effects of the constitutionally protected media on American political institutions and policymaking are extensively probed. One-third of the course is dedicated to the study of the relationship between the military and the media in order to develop meaningful policy prescriptions for future deployments, and another third of the classes is dedicated to prominent guest speakers. Finally, the semester is topped off with a trip section to New York City to meet with The New York Times, Fox News, and MSNBC to round out the educational experience.

3 Credit Hours

SS372 Politics and Government of China

First Term—Prerequisites: SS202/SS252. Corequisites: SS307/357.

This is a lecture/seminar course designed to introduce cadets to the politics and government of China. In particular, cadets will study the domestic politics of China beginning with the rise of the Chinese Communist movement. China's unique culture and the Mao years are examined as well as their impact on the past and emerging political system. Recent reforms and their implications for political, social, economic, and military structures and processes, as well as the tensions that have evolved, will be examined. External developments, such as Hong Kong's reversion to China, developments in Taiwan, changes in Central Asia, and China's emergence as a regional and world power, will be considered. What are the different approaches to analyzing Chinese politics and government? What factors determine state legitimacy and influence internal choices? How does China's domestic situation influence its external relations?

3 Credit Hours

SS373 The American Presidency

First Term—Prerequisites: SS202/SS252.

This course examines the role of the presidency in the American political system. The course begins by analyzing the constitutional origins of the presidency and the evolution of presidential power. It then turns to the development of the modern presidency in the twentieth century, with particular attention to the administrations from Franklin D. Roosevelt to the present. The course also examines the presidential selection process, conflict and cooperation between the presidency and other national institutions, and executive performance in domestic and foreign policy. The course evaluates the development of the presidency as an institution through case studies of individual presidential power and leadership.

3 Credit Hours

SS374 Politics and Governments of the Koreas and Japan

Second Term—Prerequisites: SS202/SS252. Corequisites: SS307/357.

This is a seminar course designed to introduce cadets to the politics and government in Japan and the Koreas. Cadets draw on an appreciation and understanding of culture, history, sociology, economic and political science foundations in studying the actors and relationships in Northeast Asia. Focusing on how ethnic, social, cultural, and economic factors determine state legitimacy and influence internal state choices, cadets explore the cooperation and competition between Japan, Korea, and the U.S. The course incorporates an examination of U.S. foreign policy toward Japan and Korea and explores the prospects for productive, stable relationships.

3 Credit Hours

SS375 Governments and Politics of Russia and Neighbors

Second Term—Prerequisites: SS202/SS252 and SS307/357.

This course surveys the post-Soviet landscape. It explores the political, social, economic, and cultural terrain of Russia and the other states that emerged after the collapse of the Soviet Union in 1991. The course begins with a review of Russian and Soviet history – the foundation to understanding the dramatic implosion of the Soviet Union and the tumultuous events that followed. The course also employs theories and concepts to help the cadet assess why democratization and marketization have been so difficult in this part of the world. The course concludes with an examination of U.S. foreign policy toward the region and the prospects for productive, stable ties with Russia and its neighbors.

3 Credit Hours

SS376 American Political Development

Either Term—Prerequisites: SS202 /SS252.

This seminar examines American political life, concentrating on the historical, political, economic and philosophical debates that shape our distinctive governing institutions, ideas, and political culture. Students will explain the public policy process and reflect upon political change from a variety of perspectives to include: the founders, historical and contemporary government actors, and the people. Starting with a discussion on colonial rule and the founding era, the course surveys the development of the American political system, discussing topics such as the "liberal tradition," democratic citizenship and participation, social policy in the 20th century, civil-military relations, political parties and elections, and the role of religion in public life. The course includes discussion on theories of institutional and cultural change in the constitutional order and raises strategic questions about preservation, maintenance, and reform of the American political system.

3 Credit Hours

SS377 Politics and Governments of Europe

First Term—Prerequisites: SS202/SS252. Corequisites: SS307/357.

This course focuses on the political systems and cultures of the European Union (EU) and its member states. First, the cadet is introduced to the EU, its historical development and institutional design. Implications of deepening European integration on international relations theory and state sovereignty are explored in depth. This block culminates with a study of transatlantic security issues. Cadets will explore possibilities for cooperation or role competition between the military forces of the EU and NATO, with a focus on the influence of the U.S. on the European continent. This theme continues to be highlighted throughout the remainder of the course. After this introductory block, cadets will get an overview of European state politics and look at several country case studies, both for current and aspiring member states of the EU, including a focus on democratization and the post-communist legacy in Eastern Europe. Themes that run through each case study include how history affects political culture and institutional design within European states and how these differing cultures and systems have been integrated into, or conflicted with, an increasingly centralized EU. Concepts learned in the course will be continuously applied to discussion of current challenges facing the EU and its member states.

3 Credit Hours

SS378 Advanced International Relations Theory

Either Term—Prerequisites: SS307/SS357.

This course uses the foundation provided by SS307/357 to provide cadets with an in-depth assessment of the field of international relations. The course begins by evaluating alternative theoretical perspectives, including realism, liberalism/institutionalism, and constructivism. Cadets are introduced to classic as well as contemporary works, which are examined in terms of their cultural, political, and academic context. Cadets examine topical cases pertaining to war, wealth, and state formation/transformation. Throughout the course, cadets explore the value and limitations of IR theory in framing and implementing policy.

3 Credit Hours

SS379 Legislative Politics

Second Term—Prerequisites: SS202/SS252.

This course deals principally with the U.S. Congress but also considers other legislatures, including those of state governments. It focuses on the role of legislatures in political systems. The course addresses the development of the U.S. Congress, the behavior of legislators, the workings of committees, and the responsibilities of legislative leaders. Case studies, practical exercises, and guest lecturers are used to highlight these topics. Emphasis is also placed on the Congressional Budget Process as well as the impact of Congress on military, economic, and international issues, domestic, foreign and economic policy.

3 Credit Hours

SS380 Manpower-Labor Economics

First Term—Prerequisites: SS368 and SS382.

This course studies the nature and determinants of pay and employment. The course emphasizes the role of institutions which are significant in determining the pattern and speed of adjustment in the labor market. The traditional tools of micro and

macroeconomics and econometrics are employed. Military manpower is examined as an application of the theories developed during the course.

3 Credit Hours

SS381 Cultural and Political Anthropology

First Term—Prerequisites: SS202/SS252. Corequisites: SS307/357.

The overall course goal is to provide a rich and interesting introduction to the field of anthropology. Anthropology is a holistic discipline encompassing elements of political science, economics, sociology, linguistics, and psychology. Emphasizing that one's culture is a "learned" condition, cadets explore the concept of cultural relativism and gain an appreciation for the diversity of human cultures and the interrelation of social, political and economic organizations. Cadets also examine the sub-discipline of applied anthropology, which seeks to solve contemporary social/political problems such as ethnic conflict. As a highlight of this course, cadets actively conduct anthropological fieldwork within the West Point community. Cadets develop their personal abilities to recognize their own personal biases and therefore better understand, interact and communicate with peoples from other cultural backgrounds. This is a crucial skill for future Army officers in the 21st century as recent deployment patterns have shown Soldiers operating in non-traditional situations.

3 Credit Hours

SS382 Microeconomics

Either Term—Prerequisites: SS201/SS251 and MA205/MA255.

This course is a theory course in which cadets develop a thorough understanding of microeconomic modeling and models; it is a prerequisite for most downstream economics electives. The course develops a methodology that economists use to study the interaction among individual economic agents (such as consumers, firms, and the government) and the allocation of scarce resources among these agents. The goal is for cadets to understand optimization, market, and, to some extent, policymaking, using an integrated, theoretical model. Ultimately the consequence of a change in the market environment, in public policy or in the global economy can be assessed vis-à-vis its impact on individual economic agents.

3 Credit Hours

SS383 Politics and Governments of the Middle East

Second Term—Prerequisites: SS202/SS252. Corequisites: SS307/357.

The Middle East is an area of constant and significant change. This course provides an overview of the Middle East (including the Arab world, Iran, Israel and Turkey) and focuses on the historical and political dynamics that influenced and continue to shape change in the region. Several issues will be treated in detail including: religion and state in Islam, political competition among the Arab states, the Palestinian question and the Arab-Israeli conflict, oil and the Gulf States, and the meaning of non-regional power influence in the region.

3 Credit Hours

SS384 Politics and Governments of Latin America

Second Term—Prerequisites: SS202/SS252. Corequisites: SS307/357.

This course provides an introduction to the study of the politics, political institutions, and international relations of Latin America, including Mexico, Central America, the Caribbean, and South America. It surveys the state of Latin America in the post-Cold War world with an emphasis on modernization, democratic stabilization, and economic interdependence through the comparison of the interrelated nature of policy, society, and economy, with cases from each region. The course is divided into five blocks. Block I provides an introduction, conceptual overview, and historical background. Block II focuses on the role of the state, regime types, and modernization, using case studies of key countries in the region. Block III addresses the problems of poverty and economic development. Block IV addresses social issues, including revolutionary movements, and critical problems, such as class, race, and gender. Block V provides an overview of U.S. policy toward the region, including security relations, the role of the military, and contemporary issues, such as counterterrorism and counter-narcotics policy.

3 Credit Hours

SS385 Comparative Economic Systems

First Term—Prerequisites: SS201/SS251.

This course provides cadets with the tools and knowledge for analyzing the effectiveness of different economic systems and efforts to change them. The major course objectives include an examination of the following: the historical evolution of prominent economic philosophy and theory on the functioning of capitalist and non-capitalist systems; the methods of defining and evaluating economic systems in terms of the rules and the cultural, political, legal, financial, and labor institutions that comprise an economy; the methods of institutional and cultural change and the challenges they face in the transition from a command or traditional economy to a market economy; and the paths less-developed countries may pursue toward economic development. At the end of the course cadets understand how differences among nations' economic systems might result in differences in their economic outcomes and how nations might go about changing their systems.

3 Credit Hours

SS386 Political Thought and Ideas

Either Term—Prerequisites: SS202/SS252.

Students will read critically the original works of major political thinkers, with the goal of examining different perspectives on the principal questions of political thought. Among these are: "Is government based on the consent of the citizenry?," "What constitutes a just society?," "What is the purpose of government?," and "Are freedom and equality reconcilable?" As a result of taking this course, the cadet will not only understand these central questions, but also be able to apply the theoretical prescriptions offered by thinkers to contemporary political issues currently debated throughout the world.

3 Credit Hours

SS387 Economics of Public Policy

Either Term—Prerequisites: SS201/SS251.

This course adds depth to the cadet's understanding of the fundamentals of micro- and macroeconomics. In particular, the course examines practical and theoretical issues in social welfare, public expenditures, taxation, and public choice. The course develops understanding of the value of economic models in addressing complex policy questions that occur in a fluid political environment, sharpens analytic skills, and provides a bridge to the higher-level theoretical models used in the study of the national political economy.

3 Credit Hours

SS388 Macroeconomics

Either Term—Prerequisites: SS201/SS251.

This course is dedicated to the study of aggregate economic activity. The course examines the determinants of long-run growth, and then addresses short-run economic fluctuations. The course uses various models, including the Solow Growth Model, the IS-lM model, and the

Aggregate Demand-Aggregate Supply model. The microeconomic foundations for macroeconomics are discussed, and current macroeconomic policy issues are debated. These issues are discussed within the context of both open and closed economies.

3 Credit Hours

SS391 Finance for Army Leaders

Second Term—Prerequisite: SS368 or SS360.
This course addresses most of the major personal financial planning issues cadets will face as individuals and as Army leaders. The course incorporates all of the latest concepts and procedures used in sound financial planning and effective money management. The course includes the principles of financial planning, budgeting, and time value of money and progresses through investment alternatives, mutual fund selection, and evaluation. Taxes, personal risk management, estate planning, and major purchase planning are covered during the course. The course culminates in development of a formal written financial plan based on the cadet's projected future situation several years after graduation. Prerequisites include familiarity with applied statistics and regression analysis. Armed with the knowledge and tools from this course, SS391 will provide cadets a set of analytic tools and will help them develop a way of thinking that will assist them in making numerous decisions required of an Army officer.

3 Credit Hours

SS394 Financial Statement Analysis

Either Term—Prerequisites: SS201/SS251.
This course is an organizational leader's introduction to financial and managerial accounting, essential topics for cadets concentrating in engineering management, general management, and economics. Cadets study the accounting cycle in detail, starting with analysis and recording of business transactions, and culminating in the production of the financial statements of the corporation. Cadets also study basic principles of asset valuation, revenue, and cost recognition, and analytical techniques for individual asset, liability, and capital accounts. The Managerial Accounting block is focused on cost-volume-profit analysis, job-order costing, and activity-based costing. The course culminates with a complete financial statement analysis comparison of three companies that enables cadets to apply the concepts of both financial and managerial accounting to modern corporations to answer the question: "Which company is well-managed today and best-positioned for success in the future?"

3 Credit Hours

SS399 Social Sciences Internship/ Practical Experience

Summer Term—Prerequisite: None.
The Academic Individual Advanced Development (AIAD) program is designed to give cadets practical experience in their fields of study and to reflect on their experiences by completing specified academic requirements. Recent internships involve participation in the American, European, and Russian (AMEURU) program hosted by the University of Maastricht; the Tri-Service Global Spectrum trip to Vietnam; study at the German Marshall Center; the American Institute on Political and Economic Systems (AIPES) in the Czech Republic; the International Institute for Political and Economic Studies (IIPES) in Greece; and the International Studies Program (ISP) in Eastern Europe. Scope, depth and material covered will meet the requirement of a three-credit-hour course in Social Sciences. Grades are determined based on preparatory briefings and essays, a journal of daily activities, the quality of the work performed during the internship, and a final paper, briefing, or exam that incorporates their experiences with a topic from their fields of study, due upon return.

3 Credit Hours

SS460 Seminar in Regional Economics

Second Term—Prerequisites: None.
The Seminar in Regional Economic Studies aims to provide students with a basic understanding of selected contemporary foreign economic systems and an analytical framework for the study of the modern foreign economies. Students will develop the ability to comprehend and analyze major

theoretical and policy issues in selected countries' economic development and the implications for the global economy. The course will analyze foreign economies from both micro- and macroeconomic approaches. In the microeconomic analysis, the course will pay special attention to the political economy and institutional aspects of each country. The macroeconomic portion will focus on understanding the changing macroeconomic conditions and policies in the respective country. Issues related to economic growth, business cycles, monetary and fiscal policies, financial markets, exchange rates determination, foreign direct investment and global competitiveness will be explored. This course will also use economic theory to explain the growth of sub-national regions in the selected countries. Students will gain an understanding of traditional and recent theories of national and regional growth. From term to term, the course will place particular emphasis on the economic growth problems of China, Europe, East Asia and the Middle East.

3 Credit Hours

SS462 Post-Conflict Economic Development

First Term—Prerequisites: None.

Economic Development in a Post-Conflict Environment aims to introduce the fundamental concepts in economic growth, to explain and discuss the theories of economic growth, to understand the sources of economic growth, to assess the difference in growth and wealth among countries and to increase student interest in economic growth theory. It is a course designed for economics majors with an explicit purpose of familiarizing future officers with the basic theory of economic growth and development and applying theses theories to post-conflict environments. The course achieves immediate relevance by examining the role of the military in economic development and understanding how economic development can help them be more effective members of the military profession. The course is designed as a seminar with the expectation of adequate preparation and spirited class discussion.

3 Credit Hours

SS464 Homeland Security

Second Term—Prerequisites: SS202/SS252 and SS307/357.

The purpose of SS464 is to address the complex challenges of homeland security through an interdisciplinary approach. The goal of this course is to provide future leaders with a thorough understanding of the homeland security policy area. This course explores how the evolving nature of the terrorist threat, particularly catastrophic terrorism, poses unprecedented and complex challenges to how America provides for its security. The course examines how homeland security policy intersects with other domestic and foreign policy issues, how our federalist system of government affects homeland security, and how moral, ethical, and civil liberties concerns complicate the development of effective homeland security policies. By analyzing the threat and developing an understanding of the unique policy problems and tools of homeland security, the course enables students to critically assess national efforts in such areas as border security, domestic counterterrorism policy, critical infrastructure protection, and emergency preparedness and response. Students will learn about the major policy and institutional reforms underway in the homeland security policy area, examine whether these changes are improving or will improve U.S. security policy, and develop their own views on the direction of national homeland security policy. The course will enable students to think critically about how the United States' overseas efforts to combat terrorism, preempt emerging threats, and counter the proliferation of weapons of mass destruction relate to domestic homeland security efforts. By the end of the course, students will gain a solid intellectual foundation to think critically and creatively about America's efforts to prevent terrorist attacks within the United States, reduce our vulnerability to terrorist attack, and minimize the damage and recover from attacks that may occur.

3 Credit Hours

SS465 Terrorism: New Challenges

Either Term—Prerequisite: SS307.
Disqualifier: SS474.

The purpose of SS465 is to address the challenges of terrorism in the current and future global security environment through an interdisciplinary approach. Specifically, this course examines the unique challenge terrorism poses to liberal democratic states, to policymakers and to military professionals. By analyzing the different perspectives of terrorism, given a variety of political and strategic contexts, cadets better understand terrorist motivations, strategies, means, and ends. Finally, the course explores how a liberal democratic state can best fight terrorism in this new threat environment.

3 Credit Hours

SS466 Advanced Terrorism Studies

Second Term—Prerequisites: SS465 and SS474.

The Advanced Terrorism Studies course represents a unique opportunity for students to conduct in-depth and integrated study on the most pressing past, present and future terrorist challenges to the United States and its interests. The objectives of this course are: (1) to synthesize and apply the cadet's studies across core, area, and elective course work to the thematic issue of terrorism; (2) to apply methodological skills of research design, conceptual reasoning, analysis, and research gained to terrorism; (3) to extend the cadet's in-depth study of the selected area of interest beyond the level obtained in course work with regards to terrorism; (4) to design and conduct focused research; and (5) to develop cadet skills in conceptual reasoning, critical analysis, and effective writing.

3 Credit Hours

SS468 Political Participation

First Term—Prerequisites: SS202/SS252 and SS360 or SS386.

This course provides a broad understanding of the dynamics of political participation. The goals of this course are twofold: First, it comprehensively examines both individual and group participation, as well as the many ways in which participation manifests itself in the democratic process, namely in the form of electoral (voting, campaigning) and non-electoral ("civicness," group action, etc.) behavior. As such, this course will include topics in public opinion, the electoral process, and voting behavior. Second, the approach is both empirical and theoretical. This course examines results of electoral behavior (primarily U.S. national and state elections), complemented with competing theoretical approaches that serve to explain and better understand this behavior.

3 Credit Hours

SS469 Econometrics II

First Term—Prerequisites: SS368 and MA476.

This course is an advanced study of concepts in estimation and statistical inference. Building upon the material covered in SS368, cadets learn how to challenge the assumptions of the basic regression model and how to model departures from the standard assumptions during estimation. Topics include Generalized Least Squares, Tim Series, Instrumental Variables, and Simultaneous Equations Estimation. Applications of the techniques to the estimation of economic models using actual economic data are an integral part of the instruction. The course makes substantial use of statistical software packages.

3 Credit Hours

SS470 Money and Banking

First Term—Prerequisite: SS388.

SS470 is a senior-level economics course, the primary purpose of which is to provide depth in the cadet's background and understanding of macroeconomics and international economics. The focus of the course is on the financial sector of the economy that provides the means to transfer savings from firms, households, and governments to investors who want to purchase new capital goods. The course begins by discussing the various types of financial institutions and examines the importance of financial intermediation. The course then identifies how to measure the risks faced by financial institutions and how to manage these same risks.

3 Credit Hours

SS472 The American State & The Soldier

First Term—Prerequisites: SS202/SS252.

This seminar explores the unique role of the soldier within our democratic republic. We begin by situating the profession of arms within the Executive branch as an agent to its direct principal, the Legislative branch. We proceed by examining

the similarities and differences between the military and other agents of the administrative state. We explore the military's role in providing professional expertise in the policy process and examine current trends that threaten to undermine this advisory position. Using a historical framework, we will examine the evolution of civil-military relations in times of war, peace, and perpetual conflict. We will place particular emphasis on the theories and norms of civil-military relations in a post-9/11 world including navigating the tensions inherent to the dual role of the soldier as war fighter and state builder.

3 Credit Hours

SS473 American Foreign Policy

Either Term—Prerequisites: SS307/SS357.
This course examines the development, implementation, and consequences of American foreign policy. It analyzes the actors who make American foreign policy, concentrating both on government sources such as the president, Congress, and the foreign policy bureaucracy, as well as external sources such as public opinion, interest groups, and the media. The course examines key events in U.S. foreign policy history through the lens of "policy choice." What choices did U.S. foreign policymakers confront? What policy did they choose to implement and why? What were the consequences of that policy? Utilizing the lessons from these historical case studies, the course then examines the current challenges and dilemmas that confront the United States. Some of these include U.S. relations with China, Russia, and the European Union; energy politics; the Arab-Israeli crisis; weapons of mass destruction and rogue states; terrorism; democracy promotion; and the global response to U.S. foreign policy. In exploring each of these current challenges and dilemmas, this course attempts to understand the policies and strategies the U.S. utilizes to secure its interests and achieve its objectives.

3 Credit Hours

"Political action is the highest responsibility of a citizen."

John F. Kennedy

SS475 Democratization

First Term—Prerequisites: SS202/SS257. Corequisite:s SS307/357.

This course explores the fundamental political concepts of democracy and democratization. The assigned readings examine the normative and instrumental underpinnings of democracy as well as the specific causes – and potential reversals – of the "Third Wave" of democratization that has spread throughout the world over the past three decades. The course also debates effective American policy choices for newly emergent democracies that often suffer from instability and inequality. SS475 places particular emphasis on the states of Eastern Europe and the former Soviet Union, and on the problem of constructing a new, post-Soviet security architecture in a context of democratization. The course also applies democratization concepts to the Middle East with case studies in Iraq and Afghanistan.

3 Credit Hours

SS476 Conflict Analysis, Resolution, and Negotiation

Second Term—Prerequisites: SS307/SS357.

This course provides a broad overview of the nature of global conflict in the 21st century and investigates conflict prevention, conflict intervention and management, and post-settlement operations. The course also provides cadets an introduction to the field of conflict resolution and intercultural communication, and is centered around hands-on skills-building with individual and team negotiation practical exercises that allow students to develop individual mediation and negotiation skills. In addition to graded role-play simulations, requirements include a WPR and a final conflict analysis paper and presentation in which the cadets investigate an international conflict and critique and/or develop a strategy for managing the conflict utilizing the theory, methodology and tools discussed in class.

3 Credit Hours

SS477 Economics of National Security

Either Term—Prerequisites: SS368, SS382, and SS388.

This is a capstone course for the economics major that is designed to integrate microeconomics, macroeconomics, and econometrics and apply tools learned in those courses to address policy-relevant issues in the economics of national security. The course also applies microeconomic analysis to case studies on defense personnel policies and weapon-system acquisition. The course discusses defense budgeting, including tracking the current presidential budget submission from the perspective of public finance and examines the economic impact of defense spending. Cadets use relevant databases, econometrics, and the skills they have learned as economics majors to prepare and present projects that analyze major defense and public policy decisions.

3 Credit Hours

SS478 Distinguished Professor of Security Studies Seminar

Either Term—Prerequisite: Permission of instructor.

This course is taught by a visiting scholar with a distinguished record of academic achievement and professional service in the national security arena. The seminar focuses on topical issues that reflect the professor's area of expertise. Dr. Kori Schake, a former Director of Defense Strategy and Requirements for the National Security Council and presently a distinguished fellow at the Hoover Institution, serves as our current visiting scholar. In the seminar, students take part in detailed discussions, deliver presentations, conduct research, and prepare analytical papers. Students also benefit from guest speakers who share their experiences and expertise with the seminar. Previous Distinguished Professors include Gen. (Ret.) Barry R. McCaffrey, former director of the White House Office of National Drug Control Policy; Gen. (Ret.) John Galvin, former commander of SACEUR and noted author; Professor Richard Shultz, director of International Security Studies at the Fletcher School of Law and Diplomacy; Professor Linda Brady, director of the School of International Affairs at Georgia Institute of Technology; and Adm. (Ret.) Stansfield Turner, former president of the Naval War College and director of the Central Intelligence Agency.

3 Credit Hours

SS480 Advanced American Politics, Policy, and Strategy

Either Term—Prerequisites: SS202/SS252, SS360, and SS386.

This course examines the major concepts, theoretical frameworks, and substantive dilemmas of the public policymaking process. The aim of this course is to arm students with a myriad of tools to understand, evaluate, and contextualize specific political problems in the public policy arena. SS480 is the capstone course for American Politics, Policy, and Strategy majors in the Social Sciences Department. Students will be expected to integrate the concepts of not only "sosh" basic, toolbox, and elective courses, but knowledge acquired from other courses from other disciplines as well. Public policy spans the disciplines of politics, economics, sociology, philosophy, and psychology, as policymakers wrestle with developing and implementing value-laden decisions in a world of scarcity and uncertainty. As such, the student of public policy must use a variety of social science tools – and increasingly, physical science tools as well – to dissect policy problems, develop viable and feasible alternatives, and fashion methods of adoption and implementation. Consequently, this course is designed to build upon the cadet's conceptual and analytical base in the quest to establish and refine a systematic approach to public policy analysis, formulation, adoption, and implementation.

3 Credit Hours

SS481 American Grand Strategy and Defense Policy

Second Term—Prerequisites: SS202/SS252. Corequisite: SS360.

This seminar is a survey of the politics that shape America's policy decisions over war and peace. We study the domestic influences of foreign policy and the international political dynamics that shape why and how America intervenes. It is an examination of American Grand Strategy using theoretical, historical, and practical perspectives. Drawing from various literatures, we examine and evaluate the choices our nation makes in defense policy decisions. We address questions concerning

military innovation and adaptation, change and transition in the armed services, defense resources, and capacities of actors in the defense policy arena. Using the lens of "grand strategy," we examine how defense policy decisions are influenced by a broad and complex array of political and economic factors and how these decisions shape future domestic and foreign policy environments.

3 Credit Hours

SS483 National Security Seminar

Either Term—Prerequisites: SS307/SS357.
The international politics capstone seminar provides an overview of U.S. national security policy and examines the military, political, and economic factors that influence its formulation. It establishes a conceptual framework for exploring how national interests are translated into national security policy and force structure. The course addresses three central issues: (1) the appropriate ends of national security policy, (2) the means by which we should pursue those ends, and (3) matching means with ends. Since many factors impact on strategic decisions, the course includes discussion of international, domestic, and organizational influences on national security policy. Theoretical readings combine with case studies of past and current U.S. strategic choices to illuminate critical points. The course closes by applying the lens of strategy to conduct an analysis of current proposals to revamp the structure of the Army.

3 Credit Hours

SS484 International Economics

Either Term—Prerequisites: SS382 and SS388.
This course integrates economic principles studied in SS382 and SS388. International Economics promotes understanding of the economic causes and effects of international trade, examines the justifications for and effectiveness of a variety of trade policies, explains and critiques the international flow of money, and explores the impact of these topics upon individual firms in the marketplace. The course's methodology rests on theoretical concepts and models such as profit maximization, market equilibrium, preference maximization, and macroeconomic equilibrium. The course is divided into four blocks. The first three blocks investigate the theory of international trade in goods and comparative advantage, the practice of international trade and international political economy, and the workings of international monetary markets. The final block compels cadets to apply their estimates of the international macroeconomic environment to choices made by national governments.

3 Credit Hours

SS485 Politics and Development of Sub-Saharan Africa

Second Term—Prerequisites: SS202/SS257. Corequisites: SS307/SS357.
This comparative and thematic introduction explores the important linkage between politics and economic development in Sub-Saharan Africa. At the heart of the course are the concepts of social and political development at the local and national levels of analysis. Readings and discussion will focus on key institutions and processes in contemporary Africa, such as the state, political parties, the military, and economic actors. Students will also assess the impact of international politics and the world economy on key Sub-Saharan African countries in transition to democracy and the market system. Cadets will pursue country interests through oral presentations and a research paper.

3 Credit Hours

SS486 International Security Seminar

Either Term—Prerequisites: SS307/SS357.
This Comparative Politics capstone seminar examines the special historical, domestic, and external security issues that non-Western states face, and then examines how such issues influence these states' formulation of their national security policies. Cadets explore how non-Western state regimes might use limited diplomatic, information, military, and economic means to achieve their regime goals. Cadets apply newly learned or previously learned IR or CP theories to analyze a non-Western state's national security strategy, and then attempt to anticipate what such states might do under current domestic and international conditions.

3 Credit Hours

SS487 International Political Economy

Second Term—Prerequisites: SS307/SS357.
This course develops, integrates, and applies the theoretical insights of political science and economics to contemporary issues of international trade, finance, and security. The theoretical concepts introduced in the first block build upon the ideas introduced in SS307 International Relations, SS202 American Politics, and SS201 Economics. The theory developed in the first block will be used to analyze and evaluate important historical and contemporary questions of international political economy. Specific issues areas explored include international monetary relations, regional economic integration (NAFTA, EC), Third World debt and development, protectionism, and the link between security and economics.

3 Credit Hours

Colloquium Series: SS490A, B, C, or D

SS490A Colloquium in the Social Sciences (American Politics, Policy, and Strategy)

Either Term—Prerequisites: SS202/SS252. Corequisites: SS307/SS357.

SS490B Colloquium in the Social Sciences (Comparative Politics)

Either Term—Prerequisites: SS202/SS252. Corequisites: SS307/SS357.

SS490C Colloquium in the Social Sciences (International Relations)

Either Term—Prerequisites: SS202/SS252. Corequisites: SS307/SS357.

SS490D Colloquium in the Social Sciences (Economics)

Either Term—Prerequisite: SS201/SS251.
The colloquiums provide cadets opportunities for reading and analysis in-depth in a topic area of special interest and timely relevance to their concentrations. The course employs the seminar approach in which the instructor meets with small groups to discuss assigned readings, and cadets present their own analyses to the group. Course directors develop topics and determine the semesters in which they will be offered. Department academic counselors then forward course offerings and descriptions to Social Science majors and those majoring in areas related to the colloquium topic. Topics will vary by year, but recent SS490 colloquiums include: Nationalism and Ethnic Conflict; Politics and Film; the Politics of Intelligence; Politics and Government of South and Southeast Asia; Philosophy, Religion, and Terror; and Winning the Peace.

3 Credit Hours

SS491 Senior Studies – International Relations

Either Term—Prerequisite: SS360 or SS366 or SS378 or SS386.
This course provides cadets an opportunity for reading and analysis in depth in a topic area of special interest and timely relevance to their concentration. The course employs the seminar approach in which a senior faculty member meets with small groups to discuss assigned readings, and cadets present their own analyses to the group. Course directors develop topics and determine the semesters in which they will be offered. Department academic counselors then forward course offerings and descriptions to Social Science majors and those majoring in areas related to the senior studies topic. Topics will vary by year but recent senior studies

include: Homeland Security, Advanced Terrorism, and Environmental Economics.

3 Credit Hours

SS493 Senior Studies – American Politics

Second Term—Prerequisites: SS202/SS252, SS307/SS357.
This course provides cadets an opportunity for reading and analysis in depth in a topic area of special interest and timely relevance to their concentration. The course employs the seminar approach in which a senior faculty member meets with small groups to discuss assigned readings, and cadets present their own analyses to the group. Course directors develop topics and determine the semesters in which they will be offered. Department academic counselors then forward course offerings and descriptions to Social Science majors and those majoring in areas related to the senior studies topic. Topics will vary by year but recent senior studies include: Homeland Security, Advanced Terrorism, and Environmental Economics.

3 Credit Hours

SS494 Principles of Finance

Either Term—Prerequisites: SS201/SS251.
Principles of Finance is a first course in corporate finance. The course focuses on the study of the basic principles of finance and applying them to important decisions faced by the financial manager. The course covers the following topics: project analysis using the Net Present Value technique; risk and return for assets and projects; efficient capital markets; corporate capital structure and dividend policy; and derivatives. Specifically, cadets will learn how to value a project or a company using several different methods. Cadets will analyze an actual project or corporation using the techniques that they learn in the course. As the U.S. military continues to privatize many functions, knowledge of techniques used by corporations is becoming essential for our future Army leaders.

3 Credit Hours

SS495 Senior Studies in Comparative Politics

Second Term—Prerequisites: SS307/SS366.
This course provides cadets an opportunity for reading and analysis in depth in a topic area of special interest and timely relevance to their concentration. The course employs the seminar approach in which a senior faculty member meets with small groups to discuss assigned readings, and cadets present their own analyses to the group. Course directors develop topics and determine the semesters in which they will be offered. Department academic counselors then forward course offerings and descriptions to Social Science majors and those majoring in areas related to the senior studies topic. Topics will vary by year, but recent senior studies include: Homeland Security, Advanced Terrorism, and Environmental Economics.

3 Credit Hours

SS497 Issues in Microeconomic Theory

Second Term—Prerequisites: SS360 or SS368 and approval of the department (for cadets majoring in Political Science or Economics).
This course provides cadets an opportunity for reading and analysis in depth in an area of special interest and timely relevance to their concentration. The course employs the seminar approach in which a senior faculty member meets with small groups to discuss assigned readings, and cadets present their own analyses to the group. Course directors develop topics and determine the semesters in which they will be offered. Department academic counselors then forward course offerings and descriptions to Social Science majors and those majoring in areas related to the senior studies topic. Topics will vary by year but recent senior studies include Homeland Security, Advanced Terrorism, and Environmental Economics.

3 Credit Hours

SS498 Senior Thesis: Socials Sciences

Second Term—Prerequisite: Permission required.
This course is taken in the spring term of the senior year and comprises the second and final phase of the senior thesis in Economics, International Relations, Comparative Politics, or American Politics. Cadets enrolled in SS498 normally will complete their major's integrative experience course (SS477 or SS492 for Economics, SS483 for International Relations, SS486 for Comparative Politics, or SS481 for American Politics) in the fall semester of the senior year, where they will complete a prospectus, literature review, annotated bibliography, outlines, and initial draft of their senior thesis. In SS498, students will continue work on an independent study basis with their thesis advisor and committee, conducting further research and updating drafts to produce a final written thesis product generally ranging from 30 to 50 pages in length. Students defend their theses before a committee in the last two weeks of classes.

3 Credit Hours

XH467 Winning the Peace

Second Term—Prerequisite: None.
This course helps prepare future lieutenants for what they need to know, besides military tactics and strategy, while deployed. Bringing together subject-matter experts from the staff and faculty of the U.S. Military Academy, U.S. governmental agencies, and other international actors, cadets cover topics as varied as counterinsurgency; cultural awareness; players on the ground; governance and economics; and legal, moral, and ethical considerations leaders face while deployed. We also spend two nights and three days in a multi-ethnic U.S. city, interacting with Egyptian Copts, Muslims, Hindus, and various Christian denominations to more fully understand how groups with different beliefs can live and work together. This course aims to help create "Soldier statesmen" at the company grade level for the U.S. Army, and is open to any interested junior or senior.

3 Credit Hours

XH497 Critical Thought

First Term—Prerequisites: SS307/SS357.
The purpose of XH497 Critical Thought is to improve cadets' ability to evaluate complex issues involving ethical judgments and choice among scarce resources, reach reasoned positions on these issues, and effectively argue their positions verbally and in writing. The process of pursuing this goal will make cadets better leaders, officers, scholars, and citizens. The course will employ several methods to assist in this pursuit. First, it will achieve breadth by focusing on current issues from a variety of fields, examining the "hard choices" that confront society, government, military leaders, and individual citizens. Among the disciplines from which the course will draw are Philosophy, Law, Political Science, Economics, Physics, Biology, and English. Each cadet will also be assigned an individual mentor from among the faculty of the Departments of Social Sciences, History, Law, or English. Requirements include a briefing on a current issue in the cadet's major field, a book review, and a personal statement summarizing academic and other goals.

3 Credit Hours

ZH337 Regional Political Systems

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course covering the politics, societies, and structures of states in different regions of the world. The course also covers the study of the relationship between the state and society in these regions. Regions include – but are not limited to – the Middle East, East Asia, Southwest Asia, Central Asia, North Africa, South Africa, Latin America, South America, and Europe.

3 Credit Hours

ZH347 International Organizations and Institutions

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course about international regimes, international institutions, and / or international organizations and the structure, role, and relevance of these actors in the international system. In addition, course content may include material about the relationship between international organizations and institutions and states. International organizations and institutions studied may include – but are not limited to – the United Nations, NATO, the European Union, International Economic Organizations, the International Criminal Court, and the Kyoto

Protocol / other Climate Change Institutions.

3 Credit Hours

ZH367 Topics in Microeconomics

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or in a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course about topics covered in the study of microeconomics. Topics include but are not limited to history of economic thought, manpower and labor economics, public and social policy issues, energy and natural resource issues, gender, law, and applied microeconomic issues.

3 Credit Hours

ZH377 Topics in Macroeconomics

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or in a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course about topics covered in the study of macroeconomics. Topics include – but are not limited to – international trade, foreign exchange, the international monetary system, global capital markets, and globalization.

3 Credit Hours

ZH407 Topics in American Foreign Policy

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course covering the development, implementation, and consequences of American foreign policy. It analyzes the actors who make American foreign policy, concentrating both on government sources such as the President, Congress, and the foreign policy bureaucracy, as well as external sources such as public opinion, interest groups, and the media. Topics include – but are not limited to – U.S. relations with China, Russia, and the European Union, energy politics, the Arab-Israeli crisis, weapons of mass destruction and rogue states, terrorism, democracy promotion, and the global response to US foreign policy. In exploring each of these current challenges and dilemmas, this course attempts to understand the policies and strategies the U.S. utilizes to secure its interests and achieve its objectives.

3 Credit Hours

ZH427 Topics in Comparative Politics

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course covering the history and development of state social structures, political cultures, and systems and structures of government. Topics include – but are not limited to – democratization, regional anthropology, and conflict resolution.

3 Credit Hours

ZH447 Topics in International Politics

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or in a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course about topics covered in the study of international relations. Topics include – but are not limited to – international security studies, international political economy, economic development, and the history of the development of modern international relations and the international system.

3 Credit Hours

ZH467 Topics in International Economics

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course about international economic systems, international institutions, and/or international organizations and the structure, role, and relevance of these actors in the global economic system. In addition, course content may include material about the relationship between international organizations and institutions and states. International organizations and institutions studied may include – but are not limited to – the United Nations, World Bank, International Monetary Fund, the European Union, World Trade Organization, the Bretton Woods system, and International Financial Organizations. Topics include – but are not limited to – international political economy, economic development, regional economics, and the history of the modern international economic system.

3 Credit Hours

ZH477 Topics in International Business and Finance

Either Term—Prerequisite: None.
For cadets attending foreign military academies and academic institutions. Instruction may be in English or a foreign language. Cadets will attend classes and produce papers and other academic work as required by the course instructor and the institution's academic requirements. This class serves as the equivalent to a foreign course about international and foreign financial systems, international accounting and foreign business practices. In addition, course content may include material about the relationship between businesses, institutions and states in foreign countries. Topics include – but are not limited to – corporate finance, financial statements and accounting, currency issues, central banking, and commercial and retail banking.

3 Credit Hours

The Department of Systems Engineering offers cadets the opportunity to engineer and design solutions to large-scale, multidisciplinary problems facing our Army and the nation today and in the future. The department has four distinct programs: Systems Engineering, Engineering Management, Systems Management, and our Core Engineering Sequence for non-majors. Systems Engineering and Engineering Management are accredited by the Engineering Accreditation Commission of ABET, www.abet.org. The department is also a joint proponent for the interdisciplinary major in Operations Research.

The Systems Engineering, Engineering Management, Systems Management, and Operations Research programs offer opportunities to enrich the academic experience through summer programs at military and civilian agencies. Cadets have a wide range of opportunities to conduct Advanced Individual Academic Development (AIAD) projects with the USMA

Operations Research Center of Excellence and the Center for Nation Reconstruction and Capacity Development, which are collocated with the department. Additionally, cadets may also be eligible to graduate with honors from the Systems Engineering and Engineering Management programs.

The goals of all four programs are focused on preparing future Army officers to solve a wide range of problems by engaging cadets and faculty in projects that seek solutions to major issues confronting society and the profession of arms. Furthermore, this framework helps cadets develop an understanding of the role of emerging technologies in solving large-scale problems. All of the programs are excellent preparation for graduate study in the disciplines of Systems Engineering, Engineering Management, Industrial Engineering, Operations Research, and Masters of Business Administration (MBA).

Systems Engineering Major

Systems Engineering is a top-down, interdisciplinary, lifecycle approach to the design, development, and deployment of complex systems, processes, or operations to meet the effective needs of users and stakeholder groups in a cost-effective, high-quality way. Any collection of objects that, when connected, exhibit behavior not present when these objects stand alone can be considered a "system" within the purview of this program. The Systems Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

This dynamic and growing field of engineering is focused on meeting the challenge of understanding, analyzing, and solving a class of real-world problems characterized by their interdisciplinary nature, breadth of impact, complexity, and unpredictability. Examples of "systems" include: airport planning and operations, military command-and-control systems, informal leadership structures within organizations, information management systems, software development projects, urban planning and infrastructure renewal, plant layout and manufacturing operations, physical security and vulnerability planning, and business processes re-engineering.

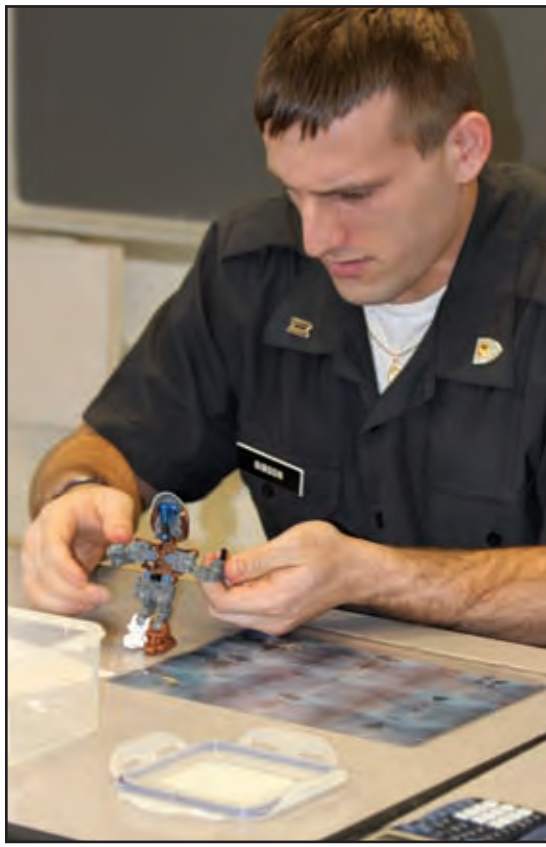
In recent years, Systems Engineering has exploded as a discipline. One can attribute this to the rapid advances in technology, the necessity for innovation and the increasing complexity of the world around us. To address these issues, part of what Systems Engineering majors learn is to build models and simulations of proposed projects to refine and test new ideas, to save resources, and avoid major mistakes before a large-scale system is actually created and implemented.

The Systems Engineering program is focused on the achievement of the following educational objectives:

1. Produce graduates for a career of professional excellence and service to the nation as an officer in the United States Army.
2. Produce graduates who effectively lead interdisciplinary teams in joint, combined, interagency, and multicultural environments.
3. Produce graduates who solve complex systems engineering problems in uncertain future environments.
4. Produce graduates who communicate engineering solutions convincingly both orally and in writing to technical and non-technical audiences.
5. Produce graduates who seek out and succeed in continued intellectual professional development in systems engineering and related fields.

The Systems Engineering program is designed to ensure its graduates can achieve the objectives listed above some years after graduation when they are serving in their chosen fields. The objectives are supported by the following outcomes that the Systems Engineering program ensures its students can accomplish upon graduation from the program.

1. Act professionally and ethically as a leader of character within each stage of the system lifecycle.
2. Employ up-to-date techniques, skills, and engineering tools necessary for Army officers and systems engineering practice.
3. Lead and work effectively as a contributing member of multidisciplinary systems engineering teams.
4. Define the problem, design solutions, make decisions, and implement the chosen engineering solution within a broad global and societal context.



5. Identify and formulate a client's engineering problem and specify the client's actual needs, using systems thinking, systems engineering, and systems decision-making.

6. Define and measure system performance to guide solution design and systems decision-making and to validate that the design solution adds value and solves the defined problem.

7. Design or re-engineer a system or process in order to develop alternatives that meet the needs of a the client within realistic environmental constraints, such as cultural, historical, legal, moral/ethical, economic, environmental, organizational, emotional, social, political, and technological.

8. Apply knowledge of mathematics, science, and engineering appropriate to Army officers and practicing systems engineers in order to develop, quantitatively evaluate, and implement effective and efficient solutions.

9. Design and conduct systems experiments, including collecting, analyzing, and interpreting data.

10. Accurately, clearly, and concisely report findings, conclusions, and recommendations to the client in a manner that supports the client's decision.

11. Apply knowledge of contemporary stakeholder issues to systems decision-making.

12. Demonstrate the skills necessary to support continued intellectual growth and learning for a career of professional excellence and service to the nation as an officer in the United States Army.

Engineering Management Major

Engineering Management majors study the engineering relationships among the management tasks of staffing, organizing, planning, financing, and leading the human element in production, research, engineering, and service organizations. By emphasizing leadership in a technical setting, the program builds on the traditional roles of the basic and applied sciences for engineering and technology management. Engineering managers must understand the interaction of organizational, technical, and behavioral variables in order to build a productive engineering team. Majors get a technical foundation in a specific engineering field of their choice: civil, mechanical, nuclear, electrical, environmental or general engineering. The program also provides a solid base of courses in personnel management, finance and accounting, engineering economy, production operations management, quantitative business analysis, project management, and computer modeling in order to prepare graduates to lead in a technical environment. The program culminates with a capstone design experience for a real client. Cadets may also be eligible to graduate with honors from this program. The Engineering Management program at West Point is one of the top undergraduate programs in the nation and is accredited by the Engineering Accreditation Commission of ABET, www.abet.org, a U.S. accreditor of college and university programs in applied science, computing, engineering, and technology. The program provides the academic foundation for a wide variety of activities important to Army officers of all branches.

Engineering Management Program Objectives: Graduates who major in engineering management:

1. Lead or participate as members of multi-disciplinary teams that succeed in diverse, multi-cultural environments around the world throughout a career of professional excellence and service to the nation as an officer in the United States Army.

2. Plan, organize, staff, manage, and control resources to provide tactical and strategic value to an organization while taking into account contemporary issues in society and the military.

3. Use strong general engineering and scientific foundations and tools to provide thoughtful analysis and innovative solutions to complex problems.

4. Effectively communicate technical and other information crucial for effective decision-making.

5. Seek out and succeed in continued intellectual and professional development in engineering management and related fields.

6. Personally engage in, model and enforce ethical and professional responsibility throughout the course of their military and engineering professional career.

Engineering Management Program Outcomes: To achieve these objectives, cadets upon graduation will:

1. Lead and work effectively as a contributing member of multidisciplinary engineering teams.

2. Lead the design or reengineering of a system, process, or organization within realistic environmental constraints such as cultural, historical, legal, moral/ethical, economic, environmental, organizational, emotional, social, political, and technological.

3. Use the techniques, skills, modern engineering tools, and technology necessary for engineering management practice.

4. Use systems thinking and engineering management techniques to identify, define, solve, recommend, and implement the solution to a client's problem.

5. Monitor, assess, and manage the broad global and societal impacts of engineering management problems, solutions, and management decisions throughout the system lifecycle.

6. Use stakeholder analysis to identify contemporary issues in engineering management.

7. Apply knowledge of mathematics, science, and engineering appropriate for Army officers and practicing engineering managers.

8. Design and conduct system experiments, including the ability to collect, analyze, and interpret system input and output data.

9. Accurately, clearly, and concisely report engineering findings, conclusions, and recommendations to clients and stakeholders to support decision making.

10. Demonstrate the skills necessary to support continued intellectual growth and learning for a career of professional excellence and service to the nation as an officer in the United States Army.

11. Act professionally and ethically as a leader of character.

Systems Management Major

Systems Management is the study of decision-making; specifically, decision-making for leaders in a world of increasingly sophisticated technology.

SYSTEMS ENGINEERING

The Systems Management program combines specific core courses with traditional engineering, systems engineering, economics, finance, and organizational management courses. Cadets will study and understand the relationships between the management tasks of staffing, organizing, planning, and financing, as well as the human element in production, research, service, and Army organizations. Systems Management analyzes these decision-making skills in the context of defense acquisition and design, leading and managing the creation of the next generation of high-technology weapons systems in accordance with performance requirements, limited budgets, and strict time schedules.

The discipline of Systems Management develops graduates' abilities to conceptualize and manage the design and implementation of high-quality, large-scale, complex systems that meet the needs of all stakeholders, including operators, maintainers, and commanders. Courses such as the Systems Management Capstone, Engineering Economy, Project Management, Systems Acquisition Management, and Financial Accounting, provide a solid foundation to enable a graduate to act as an intermediary between stakeholders and clients in an acquisition environment.

Cadets who major in Systems Management will culminate their studies by completing a capstone project for an actual client. This major will produce graduates with technical and business skills and prepare them for future academic and professional opportunities in a society increasingly dominated by technological change.

Operations Research Major

Operations Research (OR) is a scientific approach to decision-making, the focus of which is how best to design and operate systems, usually under conditions requiring the allocation of scarce resources. Today, OR is inextricably linked to the direction and management of large systems of people, machines, materials, and money in government, industry, business, and defense.

Since its inception during WWII, the inter-disciplinary field of OR has set itself apart as an applied mathematical science and engineering discipline with a diverse range of applications. Because of the increased demand for OR analyses within the Army, the OR specialty (FA49) continues to enjoy steady growth in membership, and is associated with superb educational and promotion opportunities throughout an officer's military career.

The OR program at West Point is jointly sponsored by the Department of Systems Engineering and the Department of Mathematical Sciences. West Point remains the single-largest source of FA49 officers for the Army. Graduates of the OR program at West Point are well-prepared to tackle some of the Army's most challenging problems and to pursue graduate study in support of the FA49 career field.

Systems Engineering Sequence

The Systems Engineering Sequence consists of three courses. Cadets enrolled in the Systems Engineering core sequence may start the sequence in the first or second term of their junior year. The three course sequence must be completed in consecutive semesters.

The first course (SE300) is an introduction to systems engineering, systems thinking, and the systems decision process. Cadets are introduced to modeling and complete two case studies. Cadets learn techniques to understand complex systems, their interactions, and the concept of value-focused thinking centered on decision makers and stakeholders.

The second course (SE350) introduces cadets to a range of modeling and analysis techniques using Microsoft Excel® and other simulation software. The course provides a link between systems thinking and the systems decision process and the tools used to solve real world problems. Completing this course equips cadets with fundamental stochastic and deterministic modeling tools as well as decision economic analysis techniques.

The final course (SE450) is a capstone design course in which cadets apply the system decision process and the modeling techniques from previous courses to real-world systems at the United States Military Academy. These projects require cadet teams to apply the principles of project management, modeling, and decision analysis while interacting with a real client on a real problem. In the past, these clients have included the Director of Admissions, the Cadet Arms Room, the Boy Scouts of America, the Directorate of Cadet Activities, the Directorate of Intercollegiate Athletics, and the offices of the Dean and Commandant.

For further information, please contact the Department of Systems Engineering at (845) 938-2701, or visit the department at www.dean.usma.edu/se.

Course Descriptions

SE300 Introduction to Systems Engineering

Either Term—Corequisite: MA206.
SE300 serves as the "roadmap" course for all cadets taking the three-course Systems Engineering sequence. This course presents the methodological framework and techniques for designing, implementing, managing, and reengineering large-scale systems or processes. Cadets learn engineering design and engineering management processes and gain an appreciation for the future environments and systems lifecycles. Cadets analyze case studies and complete practice problems to illustrate mastery of course topics. Cadets also use spreadsheet software for modeling and analyzing design alternatives. Cadets will spend eight to 12 lessons in a computer lab environment.

3 Credit Hours

SE301 Foundations of Engineering Design and Systems Management

Either Term—Corequisite: MA206.
SE301 serves as the "roadmap" course for all cadets taking the Engineering Management, Systems Engineering, or Systems Management major. This course presents the methodological framework and techniques for designing, implementing, managing and reengineering large-scale systems or processes. Cadets learn engineering design and engineering management processes and gain an appreciation for future environments and system lifecycles. Cadets analyze case studies and complete practice problems to illustrate mastery of course topics. Cadets also use spreadsheet software for modeling and analyzing design alternatives. SE301 introduces an engineering design and systems management methodology while incorporating material from courses in the USMA core curriculum and previews the modeling and decision-making tools that cadets will learn in follow-on Department of Systems Engineering courses. The course is designed to allow cadets the opportunity to learn engineering design and engineering management processes on an individual level so that each cadet will have the experience necessary to succeed in future Systems Engineering courses. Cadets will spend eight to 12 lessons in a computer lab environment.

3 Credit Hours

SE350 Systems Modeling and Design

Either Term—Prerequisites: SE300 and MA206.
SE350 is the second foundation course of a three-course sequence for non-engineering cadets. Its focus is on the application of economic, deterministic, and stochastic models. These tools are used in systems engineering to analyze and interpret alternatives. Cadets learn to apply various modeling techniques to represent and solve real-world problems in the military and industry. Topics include: the time value of money, decision analysis, forecasting methods, networking, queuing to simulation modeling. The course introduces various techniques to analyze data and draw inferences from that output. SE350 utilizes traditional classroom setting and computer labs, insisting that cadets understand and apply the fundamental principles and assumptions of analytical models. Cadets practice innovative uses of spreadsheets to develop and analyze models. A key goal is for cadets to communicate their analysis and recommendations to a decision-maker. Ethical responsibilities in describing the results of analyses to decision-makers are integrated throughout the course. Cadets are expected to apply their knowledge of course material in several computer lab exercises throughout the course.

3 Credit Hours

SE370 Computer Aided Systems Engineering

Second Term—Prerequisites: IT105 or IT155, and SE301.
Cadets learn how to use information and technology in support of systems decision-making. They learn the basics of data collection and storage through a database design exercise. They learn how to manipulate data in spreadsheets to support decisions. The course introduces cadets to 2- and 3-dimensional virtual design and visualization. They also get an introduction to geospatial data analysis and display in support of military operations. Cadets learn how to effectively use technology while interacting with decision-makers. Communication skills are developed through both written and oral projects and development of interactive graphical presentations. Cadets will spend most lessons in a computer lab environment.

3 Credit Hours

SE375 Statistics for Engineers

Either Term—Prerequisite: MA206.
Disqualifier: MA376.
This course is an integral part of the Systems Engineering major that emphasizes both the statistical analysis of data and a statistical methodology important to systems analysis and design. The overarching course goal is to develop critical consumers and providers of statistical information as it relates to the techniques, activities, and modeling applications that typify systems engineering concerns. The course builds on the core probability and statistics course and introduces statistics applications fundamental to the design and analysis of simulations and engineering systems. Specific topics include point and interval estimation, parametric and nonparametric tests of hypotheses, analysis of variance, linear regression, and survey design of experiments, specifically analysis of power and determination of sample size. The course emphasizes the importance of knowing and understanding the assumptions associated with the use of inferential statistics as well as the usefulness of statistical software packages. The basic principles learned in this course will facilitate data analysis in support of Army acquisition and system redesign decision-making. Ethical implications in the analysis and presentation of experimental results, as well as interactions with decision makers, are addressed.

3 Credit Hours

SE385 Decision Analysis

Second Term—Prerequisite: MA206.
TThis course presents basic techniques of decision-making concentrating on both theoretical and modeling aspects. This course develops innovative systems engineers who can integrate the art and science of decision-making for single and multiple objective environments to support the Decision-Making Phase of the Systems Decision Process (SDP). The focus of the course is modeling problem structure, uncertainty, risk and preference in the context of decision-making. Topics include influence diagrams, decision trees, sensitivity analysis, assessing subjective probability, value of information, risk and uncertainty. Cadets will also use value focused thinking to support decisions in multiple objective and resource allocation

environments. A series of several computer laboratory exercises provides a key bridge between the mathematical theory and the application of skills to open-ended decision problems. Communication skills are developed with both written reports and oral presentations.

3 Credit Hours

SE387 Deterministic Models

Either Term—Prerequisite: IT105 or IT155. Disqualifier: EM384.
This course is the first of a two-course sequence that emphasizes modeling and analysis of real-world systems. This course focuses on modeling techniques without consideration of uncertainty or probabilistic effects. The course introduces the deterministic modeling process and many of the classical deterministic models used by systems engineers, operations researchers, and management professionals to identify and analyze alternatives as part of the Systems Decision Process (SDP). Emphasis is placed on creative application of the modeling process to include formulation, solution methods, analysis of results, and interpretation. Topics include deterministic life cycle cost modeling, linear programming, sensitivity analysis, networks, transportation models, dynamic programming and integer programming. Cadets will spend several lessons in a computer lab environment.

3 Credit Hours

SE388 Stochastic Models

Second Term—Prerequisites: SE387 and MA206.
This course is the second of a two-course sequence that emphasizes modeling and analysis of real-world systems. Continuing from the modeling process introduced in SE387, this course introduces the stochastic modeling process and many of the classical stochastic models used by systems engineers, operations researchers and management professionals to capture and describe quantitative effects of uncertainty on decision-making as part of the Systems Decision Process (SDP). Topics include stochastic life cycle cost modeling, conditional probability models, basic inference chains, Markov Chains, Poisson Processes, birth and death processes, counting processes, queuing systems, and simulation. Cadets will spend several lessons in a computer lab environment.

3 Credit Hours

SE400 Professional Engineering Seminar

Second Term—Prerequisite: None.
This seminar course for SE and EM majors meets once a week to address the concerns of professional engineers such as engineering ethics and licensing procedures. The seminar also includes presentations by guest lecturers from the military, DoD industrial base, and academic communities.

1 Credit Hour

SE402 Systems Design I

First Term—Prerequisite: SE388 or EM384.
Systems Design I is the first course in a two-semester capstone experience for Information Systems Engineering, Operations Research, and Systems Engineering majors. SE402 integrates the principles, concepts, and models explored in previous core and engineering topic courses. The course applies the principles of systems design, engineering management, and/or reengineering to a real-world system. Cadets work under the supervision of a faculty member to address a problem presented by a real-world client, providing them an integrative experience for their education in engineering design.

3.5 Credit Hours

SE403 Systems Design II

Second Term—Prerequisites: SE301, SE388, SE402.
Systems Design II is the second course in a two-semester capstone experience for Systems Engineering, Information Systems Engineering, and Operations Research. SE403 integrates the principles, concepts and models explored in previous core and engineering courses. The course applies the principles of systems design, engineering management, and/or reengineering to a real-world system of direct concern to a real-world client. Cadets work under the supervision of a faculty member to continue work on the same

project begun in SE402, culminating the integrative experience in their education.

3.5 Credit Hours

SE450 Applied Systems Design and Decision Making

Either Term–Prerequisite: SE350.

This course is the third course of the three-course systems engineering sequence. The course serves as the culminating systems engineering experience for non-engineering cadets and integrates the principles, concepts, and models explored in previous courses. Cadets apply the Systems Decision Process to devise technological problem solutions that are effective and adaptable. Cadets work in groups to complete a culminating engineering design experience involving the solution of an incompletely defined problem with no single correct answer. Cadets must consider the economic, political, social, and ethical constraints of the system and use creativity to generate potential design alternatives. Cadet groups will use models to analyze the alternative solutions and make a recommendation based on economic analysis and system performance. The course requires assessment of the recommended solution and a written plan for implementation.

3 Credit Hours

SE485 Combat Modeling

First Term—Prerequisites: MA376 or SE375 or EM384.

This course explores the theoretical and practical issues in combat modeling and simulation – the study of combat systems, tactics, and the battlefield environment in conflicts between opposing forces. The course focuses on models and algorithms used in state-of-the-art combat simulations, and techniques for analyzing their effects. Major topics of investigation include functional analysis to support modeling using functional flow diagrams and/or IDEFØ models, combat attrition models, search and detection methods, terrain representation, and measures of effectiveness. Cadets learn to manipulate 3D visual and system characteristic databases to build and test virtual prototypes of new combat system designs. Application of design of experiments and statistical analysis methods assist cadets in assessing the effectiveness of weapons systems, doctrine, and tactics on the future battlefield. The cadet can apply the concepts learned in this course to evaluate potential new Army combat systems, force structures, or doctrinal changes. The techniques taught in this course are a significant part of the Systems Decision Process (SDP) as they encourage creative and independent thought that applies mathematical, physical, and computer sciences to solve future technological problems. Ethical implications in the development and use of combat models also are discussed.

3 Credit Hours

SE489 Advanced Individual Study in Systems Engineering or Engineering Management

Either Term—Prerequisites: As determined by faculty advisor.

This is a tutorial course in which an individual cadet or a group of cadets study in depth an advanced topic in systems engineering or engineering management under the direct mentorship of a faculty advisor. The faculty member assigned to the course is responsible for developing the course topic or topics and advertising the course to prospective cadets. Additionally, the scope of the course can be tailored to the desires of the cadet(s) in consultation with a faculty advisor. Cadets will coordinate with a faculty mentor who has an interest and background in the research area and who will assist in scoping and developing course content. Communication skills are developed and assessed through both written reports and oral presentations.

3 Credit Hours

SE491 Research Project in Systems Engineering/Engineering Management

Either Term—Prerequisites: As determined by faculty advisor.

The cadet, or cadet team, integrates the concepts and techniques learned in previous Systems Engineering or Engineering Management courses to solve a current problem of interest to the academy, the Department of the Army, or other agencies in the Department of Defense. Subject to approval from the course and program directors, cadets may select project topics which are follow-on research from their summer AIAD experience, a topic of interest to them, or one that is compatible with ongoing research within the Department of Systems Engineering and/or the Operations Research Center of Excellence. Cadets will coordinate a faculty mentor who has an interest and background in the research area and who will assist in scoping the project and directing the research effort. Cadets may work individually or in small teams, depending on the nature of the research. The course will culminate with a student presentation and a written report.

3 Credit Hours

EM381 Engineering Economy

Either Term—Corequisite: MA205 or MA255.

This course prepares cadets to consider the economic dimension in the evaluation of engineering alternatives, a consideration vital to the systems design process, engineering management, systems acquisition, and many other application areas. While emphasis is on the analytical consideration of money and its impact on the areas above, the course also incorporates professional ethics in the engineering economic analysis process. The course is taught in four lesson blocks. The Time Value of Money (TVM) block includes the quantitative methods for economic analysis of engineering alternatives by introducing cost concepts, interest concepts, the cash flow diagram, and developing interest formulas. The Analysis Methods block develops techniques for project evaluation and comparison and ways to account for risk and uncertainty. The After Tax Cash Flow block incorporates the real-world effect of taxes, depreciation, and inflation into the analysis methods. The Capital Budgeting block completes a comprehensive introduction to engineering economy by introducing the concept of economic service life and project financing. A one-lesson introduction to personal finance is included to demonstrate how many of the concepts used in the business world can also be applied for personal planning. Course concepts are applied using Microsoft Excel® in both graded and ungraded labs. Cadets will spend several lessons in a computer lab environment.

3 Credit Hours

EM384 Analytical Methods for Engineering Management

First Term—Prerequisites: IT105 or IT155. Corequisite: MA206.

EM384 focuses on the application of deterministic and probabilistic models used by analysts to make engineering and management decisions. Cadets learn to apply various modeling techniques to represent and solve real-world organizational problems in the military and industry. Topics include: linear and integer programming, network modeling, decision-making under uncertainty, queuing, and simulation modeling. Cadets apply concepts and tools using Microsoft Excel® within a computer lab environment. The techniques taught in this course have been applied to an increasingly wide variety of complex problems in business, government, military, health care, and education. Ethical responsibilities in describing the results of analyses to decision makers are integrated throughout the course. Cadets develop communication skills through two written reports and make innovative use of spreadsheets to develop and analyze models. Cadets are tested on the application of concepts of the course from the four blocks of instruction during four graded labs, two out-of-classroom assignments, and two in-class WPRs. Cadets will spend several lessons in a computer lab environment.

3 Credit Hours

EM402 Engineering Management Design I

First Term—Prerequisites: SE301, EM381, and EM384. Corequisite: EM411.

This is the first course in a two-semester capstone design for EM majors. EM402 integrates the principles, concepts, and models explored in previous core and engineering topic courses. The course applies the principles of systems design, engineering management, and/or reengineering to a real-world system. Cadets work under the supervision of a faculty mentor to address a problem presented by a real-world client, providing them an integrative experience for their education in engineering design.

3.5 Credit Hours

EM403 Engineering Management Design II

Second Term—Prerequisite: EM402.

Engineering Management Design II is the second course in a two-semester capstone experience for EM majors. EM403 integrates the principles, concepts, and models explored in previous core and engineering courses. The course applies the principles of systems design, engineering management, and/or reengineering to a real-world system. Cadets work under the supervision of a faculty mentor to continue work on the project that was begun in EM402, culminating the integrative experience in their education.

3.5 Credit Hours

EM411 Project Management

First Term—Prerequisite: None.

This course develops skills required to lead an organization to the achievement of their objectives through the proper application of the management of planning, implementing, and controlling the organization activities, personnel, and resources. The course focuses on the implementation phase of the Systems Decision Process (SDP). Topics include project selection, roles and responsibilities of the project manager, planning the project, budgeting the project, scheduling the project, allocating resources to the project, monitoring and controlling the project, evaluating and terminating the project, risk assessment and management, organizational structure, and human resources. Case studies illustrate problems and how to solve them. Course assignments are designed to help cadets learn and apply project-management techniques taught in the course. The class design project will provide students with the opportunity to integrate project-management software, Microsoft Project®, into the preparation of an Engineering Management Project Plan. Cadets spend several lessons in a computer lab environment.

3.5 Credit Hours

EM420 Production Operations and Systems

Either Term—Prerequisite: MA206.

This course deals with the quantitative aspects of design and analysis of production operations management. Emphasis is on identification, analysis, and solution of production problems using applied quantitative techniques. Practical exercises reinforce the problem-solving techniques necessary for today's successful military and civilian engineering managers and systems engineers. Specific methods and techniques taught and applied are operations strategy, product design and selection, supply chain management, total quality management, forecasting, capacity planning, facility location, facility layout, work system design, inventory management, material requirements planning, and scheduling. This course is required for those pursuing the Engineering Management major, the Systems Engineering major, the Systems Management major, and the Management major. Cadets will spend several lessons in a computer lab environment.

3 Credit Hours

EM481 Systems Simulation

Either Term—Prerequisite: MA206.

Cadets learn and explore discrete event simulation techniques and tools used to analyze and improve complex systems. Applications include operations, transportation, manufacturing, and logistics

systems. Topics include functional modeling with functional flow diagrams and IDEFO models, simulation theory, the modeling process, input data analysis, generation and testing of random numbers, verification and validation of simulation models, experimental design, output analysis, and application using simulation software. The course concepts provide cadets the tools to evaluate military and civilian systems. Emphasis is placed on using simulation in the Systems Decision Process (SDP). Cadets demonstrate proficiency and develop communication skills through design projects and briefings. Cadets spend several lessons in a computer lab environment.

3 Credit Hours

SM401 Systems Management Capstone

Second Term—Prerequisites: EM381, EM411, and SE301.

This is the integrative, capstone course for the Systems Management major. SM401 integrates the principles, concepts, and methodologies presented in the methods and formulation courses by providing the cadets the opportunity to develop or improve real-world systems and plan for their implementation. Real-world problems offer cadets an opportunity to design creative alternative solutions to current, open-ended problems representative of those found in today's society and Army. Cadets will work in teams to apply the systems decision process while applying knowledge of mathematics, science, and modern engineering tools, and technologies to provide accurate, representative, and reliable models of alternative solutions that satisfy client needs. Cadets develop their communicative skills as members of the team through presentations and written reports. Ethical implications in the design and development of real-world systems, as well as interaction with decision makers, are included in the course.

3.5 Credit Hours

SM421 Systems Acquisition Management

Second Term—Prerequisite: EM411.

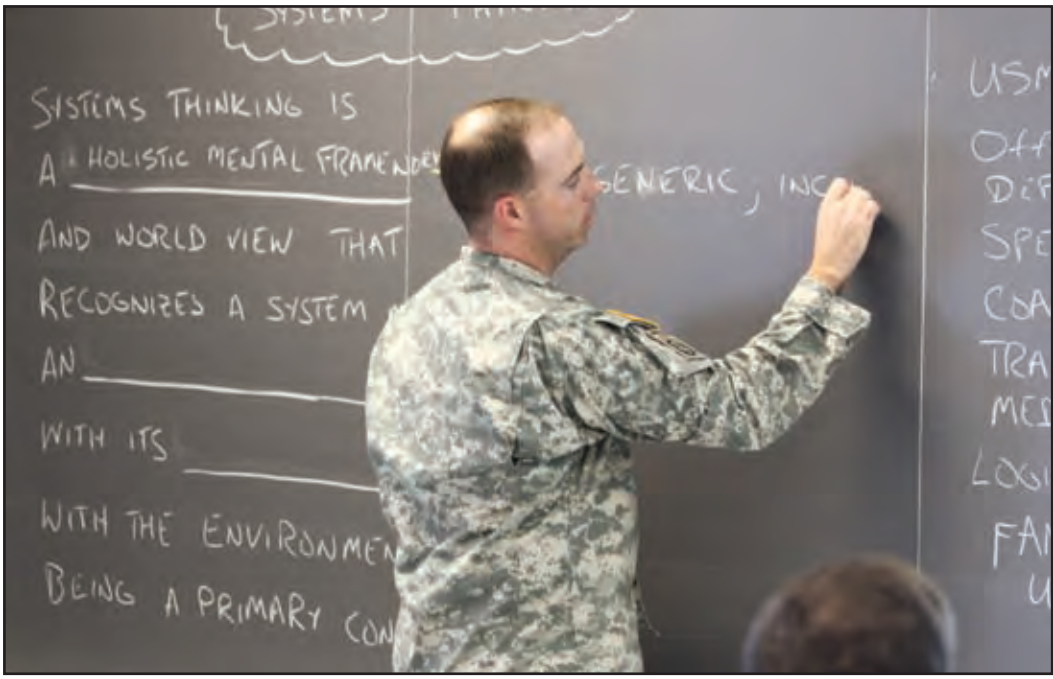
This course develops skills related to the acquisition tasks of strategically managing, planning, and implementing acquisition programs and reforms. The course focuses on using fundamental concepts that enhance acquisitions management processes and outcomes. Topics include the acquisition core competencies: theory and principles, systems perspective, project management, technology integration, and modeling and simulation. Other topics include knowledge management, organizational behavior, decision-making, and risk management. Case studies illustrate acquisition issues and how to solve them. A course project provides practical application reinforcement of acquisition principles. The course also addresses ethical implications in the acquisition of systems to accomplish military missions.

3 Credit Hours

SM482 Supply Chain Engineering and Information Management

First Term—Prerequisite: None.

This course teaches cadets the strategic importance of good supply chain design, planning, operation, business processes, and information management systems. Cadets will become familiar with engineering a supply chain network, conducting inventory management, and executing risk pooling to maintain a competitive advantage. Cadets develop the ability to evaluate how information flows can substitute for the stock of physical resources, such as inventory, and why such systems succeed or fail through the explanation of concepts, insights, practical tools, and information technology that supports decision-making. This course will focus on understanding the key drivers of a supply



and principles are applied to military and civilian applications, such as physical systems, human decision processes, population, and economic/business processes. Cadets develop communication skills by presenting their design results in both written reports and oral presentations. The course also addresses ethical implications in the development and application of dynamic models as well as interactions with decision makers. Cadets will spend several lessons in a computer lab environment.

3 Credit Hours

chain, such as supply contracts, procurement and outsourcing, information sharing, supply chain integration, and distribution practices. Cadets will then apply their knowledge of Supply Chain Engineering and Information Management to SAP Enterprise Resource Planning software simulations to demonstrate their understanding of the business processes and information systems management. Cadets will also learn to assess the impact of strategic alliances and globalization on supply chain strategies and best practices, to include smart pricing, customer value, and new product and supply chain design.

3 Credit Hours

SM484 System Dynamics Simulation

First Term—Prerequisite: None.

This course is a simulation elective for the Systems Engineering, Engineering Management, Information Systems Engineering, Operations Research, and Systems Management majors. Simulation modeling can be used to study the effects of changes to existing systems or processes, or evaluate the performance of new systems prior to their implementation. The techniques taught in this course are a significant part of the Systems Decision Process (SDP) as they introduce the concept of dynamic systems thinking and analysis. By their nature, large-scale systems are dynamic. These systems involve complex cause-and-effect relationships that form feedback loops between the variables of interest. These systems produce outcomes that are not always intuitive. The cadets use the properties of dynamic systems and analytical techniques to design continuous models of complex systems or processes, implement these models, and perform an analysis of the results. Topics include applications of Systems Dynamics; client/modeler relationships; problem articulation; functional modeling through causal loop diagrams and stock and flow diagrams; modeling and simulation in a PC-based continuous event simulation package; policy design; policy testing; and policy implementation. These concepts

Each year during late June or early July, a new class, designated Fourth Class cadets, enters the United States Military Academy. In succeeding years, they become members of the Third Class, Second Class, and finally — in their senior year — First Class.

The United States Military Academy's purpose is to educate, train, and inspire these select young men and women for exemplary service as commissioned officers in the Regular Army of the United States. The first step in this training is discipline. The daily regimen of cadet life is designed to develop an appreciation for discipline and the need to maintain professional standards of the highest order. Self-discipline, selfless service, attention to details and enforcement of standards are among the characteristics most highly prized within the cadet corps.

MILITARY PROGRAM

CHAPTER 6

Brigadier General
Theodore D. Martin
Commandant of Cadets

Cadets discover that at West Point they must make that "extra effort," budget their time wisely, and establish a clear sense of priorities. In the tradition of West Point, cadets become aware of and learn to fulfill their responsibilities to the Soldiers they will eventually lead. The military training program is dedicated to inspiring and preparing cadets to lead this nation's sons and daughters in the defense of freedom.

Professional Education and Training

Future officer-leaders must master fundamental military concepts and skills, and understand tactics and doctrine. They must understand and commit themselves to the demanding code of ethics of the American professional Soldier.

Each cadet receives instruction in the fundamentals of small-unit tactics and leadership through the study of military science and leadership. Physical education and an extensive intramural program (discussed in Chapter 7) ready the cadet for the physical demands of service life and the combat environment. Four summers of field training give each cadet repeated opportunities for the practical application of principles learned, while sustaining the high level of fitness demanded of the Army officer.

Classroom instruction and practical experience in the field are combined to

Organization

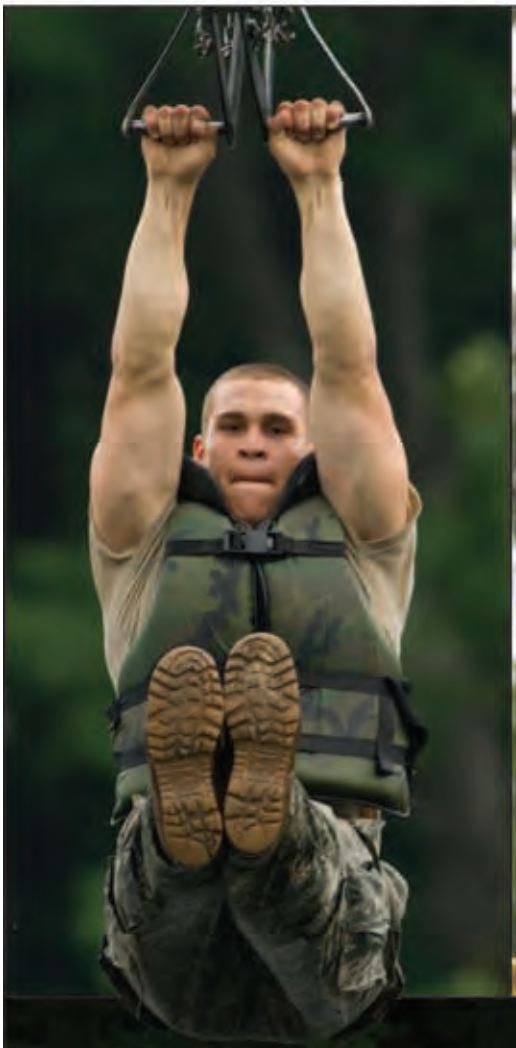
The Office of the Commandant of Cadets oversees all aspects of the military training and development of the corps within the context of the Military Program. This program provides a dynamic four-year sequential and integrated developmental process to teach, train, and inculcate the fundamental military knowledge, skills, and abilities expected of an Army officer.

The Office of the Commandant is organized with a supporting staff and separate departments to execute the Military Program. The United States Corps of Cadets (USCC) staff provides administrative, logistic, and training management in support of the Corps of Cadets. The Department of Military Instruction (DMI), discussed in the following section, provides formal Military Science education and organizes the majority of military training. The Brigade Tactical Department oversees the daily activities of the cadets.

develop in each cadet the basic leadership expertise critical to the Profession of Arms. A strong sense of duty and responsibility is especially valued. In addition to self-discipline, each cadet learns to exercise good judgment, even when thinking and reacting under mental and physical stress and the demands of time. The cadet's high standards, manner, bearing, and appearance are but the visible signs of a deep pride in the profession. Like The Long Gray Line of graduates before them, West Point cadets share a sense of dedication to "Duty, Honor, Country."

Fourth Class Year

During their first day at West Point, the men and women of the incoming class make a rapid transition not only from civilians to cadets, but from civilians to Soldiers. They discover that they are expected to produce phenomenal results in a single afternoon, and they discover that they can do it. Beginning with this particularly challenging first day, new cadets start the intensely rigorous six-week Cadet Basic Training Program (CBT) designed to teach them to be both Soldiers and cadets. They learn to answer to "new cadet" and to make every response with the traditional military courtesies. They



learn to wear the cadet uniforms, to prepare their rooms for exacting inspections and to participate in parades.

Many hours of tough physical exercise prepare them for the long foot marches, rappelling, rifle marksmanship, and tactical maneuvers that are part of their field training in the basic skills of the individual Soldier. Like all new Soldiers everywhere, new cadets learn to respond quickly and accurately to their commanders under conditions of mental and physical stress. The primary purpose of the new cadets' experiences during these six weeks was expressed very well by a cadet who stated that the training was ". . . the most significant event in my life. It has provided for me exactly what I came here for: discipline, personal pride and confidence, and a high sense of duty." Another reason for this type of training is that officers can perform with greater perspective and understanding if they have at one time experienced the life of the Army recruit. Equally important, new cadets sharing a rigorous experience form strong friendships and team spirit that remain with them for the rest of their lives.

In mid-August, the end of this initial training period, new cadets are formally accepted into the corps. These new members of the United States Corps of Cadets have a well-deserved sense of confidence and pride, which comes with the knowledge that they have successfully completed a long, physically and emotionally demanding period of their lives. During the Acceptance Day parade ceremony, each new member of the Fourth Class, traditionally called a "plebe," is assigned to one of the 36 companies that make up the corps.

Military instruction during the rest of the Fourth Class year introduces cadets to the military profession, focusing on the Army Values, the professional qualities of an officer, and the military branches of the Army. It also provides detailed instruction on map reading and small-unit tactics. The academy also stresses physical development, a trend that continues throughout a cadet's life and during service in the Army.

Third Class Year

After a short leave, Third Class cadets (known traditionally as "Yearlings") report to West Point's Camp Buckner for seven weeks of military field training. The emphasis in Cadet Field Training (CFT) is on the close, combined fight, both light and mechanized. Extensive training on infantry operations, artillery firing, weapons training, Army aviation, military engineering, and land navigation makes up most of this training experience. Additionally, one week is spent at Fort Knox, Ky., for familiarization with armor, cavalry, mechanized infantry, self-propelled field artillery, and combat engineer operations.

The training during these seven weeks is designed to be physically and mentally demanding and to push the cadets to new personal heights. The cadets are challenged to give everything they have and then are challenged to give more.

Members of the Third Class emerge from the summer inspired about their future profession and role as commissioned officers. They have a better appreciation for leadership in stressful conditions; for mental and physical toughness and endurance; for the skills necessary to fight and win our nation's wars.

Second Class Year

During the Second Class summer, cadets further develop their leadership skills by serving as noncommissioned officers within the Corps at Cadet Basic Training and Cadet Field Training, and participating in Military Development School (MDS) in schools such as Airborne, Air Assault, Sapper Leader's Course, and Combat Diver. Other cadets receive leadership experience in actual Army units worldwide. Cadets participating in Cadet Troop Leader Training (CTLT) gain first-hand experience in leading real Soldiers. Cadets are also introduced to the unique bond shared among Soldiers and military families, as well as among the commissioned and noncommissioned officer corps.

In all of the above programs, cadets practice many of the skills learned at the academy and gain invaluable appreciation for the challenges faced by Soldiers and leaders in the active Army. Most cadets treasure these experiences as the most memorable of their four years at the academy as they make a new commitment to serve our nation.

First Class Year

With the arrival of the long-awaited First Class year come more privileges and latitude, and much greater responsibility. During the summer before starting this final academic year, one-quarter of the First Class serves in cadet officer positions, leading the training of the Third Class cadets at Camp Buckner and the new cadets during Cadet Basic Training. The remainder of the First Class participates in the CTLT and MDS programs mentioned above, if they did not do so the previous year. With four years of intensive military training experience, First Class cadets are selected to fill leadership positions from commander (known as the "first captain") of the 4,000-member corps, to leaders of 30-member platoons, and staff positions that involve management of all the activities of the Corps of Cadets. The opportunities for planning, organizing, and leading are almost limitless.

The culmination of the military training programs occurs on graduation day as the cadets shed "Cadet Gray" for their Army uniforms, and join a time-honored officer corps. Cadets confirm their commitment by taking the commissioning oath and swearing to protect and defend the Constitution, and to faithfully and selflessly lead American Soldiers.

The Brigade Tactical Department is responsible for the daily operations and control of the Corps of Cadets. The department is led by the brigade tactical officer, and is organized into four regiments, each commanded by a regimental tactical officer. Each regiment is organized into nine cadet companies (A through I), with each cadet company commanded by the company tactical officer, and assigned a company tactical noncommissioned officer.

BRIGADE TACTICAL DEPARTMENT

Mission

The mission of the Brigade Tactical Department is to develop and train cadets, through integration of West Point programs, to be leaders of character, committed to Duty, Honor, Country, and inspired for careers as U.S. Army officers and a lifetime of selfless service to the nation.

The members of the department accomplish this mission in diverse ways. Tactical officers and tactical noncommissioned officers (company TAC teams) are the integrators of West Point's developmental programs. They oversee each cadet's individual development in the academic, military, physical, and moral-ethical dimensions. The TAC teams train the cadets with a continual focus on leader development. The tactical officer is the legal commander of each cadet company and is responsible for the establishment and maintenance of a climate that fosters individual and unit excellence in all program areas.

Role

The role of the TAC Team is very diverse – mentor, counselor, leader, motivator, trainer, evaluator, commander, role model, administrator, and teacher. Tactical officers and tactical noncommissioned officers are chosen from the Army based on their demonstrated abilities and potential in all of these areas. All company TACs have been successful company commanders during their Army careers. The NCOs have all been successful platoon sergeants, drill sergeants or first sergeants. Their combined abilities, experiences, and training inspire and motivate cadets in preparation for their Army careers.

TAC teams interact daily with cadets across the developmental spectrum. They are in the company area when cadets wake in the morning and attend all formations with

"Leadership and learning are indispensable to each other."

John F. Kennedy

"Attitude reflects Leadership."

Author Unknown

the cadets. TAC teams regularly teach numerous leadership and professional development classes. They attend drill and ceremonies practice, military training, and intramural sporting events with their companies. They perform these same duties during the summer training period during Cadet Basic Training or Cadet Field Training. Additionally, many tactical officers and tactical noncommissioned officers are assistant coaches, officer representatives, or officers-in-charge of cadet corps squad teams and cadet sports clubs and activities.

TAC Teams regularly interact with cadets' professors, mentors, coaches, staff, faculty, and parents. Tactical officers and tactical NCOs are the point of contact for any questions or concerns about cadets.

USCC Chaplains

A large and enthusiastic group of cadets participate in and lead the numerous activities offered in the four West Point chapels. Whether it is acting as a religious education teacher, singing in one of the cadet choirs, or serving as an usher or acolyte, cadets find opportunities to nurture their own spiritual lives as well as provide inspiration for the West Point Community.

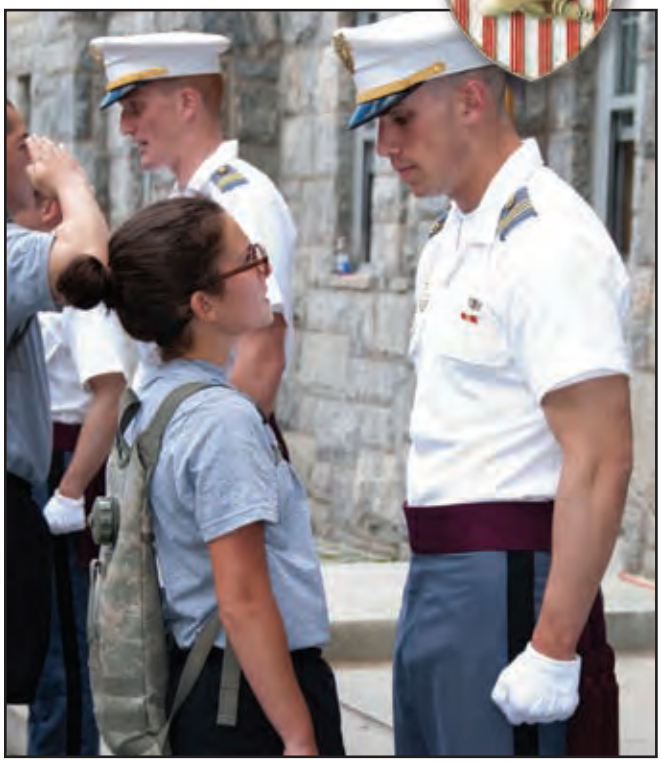
Protestant and Eastern Orthodox services are offered each Sunday in the Cadet Chapel. Catholic masses are celebrated daily at Holy Trinity Chapel, and Jewish cadets attend service each Friday at the Jewish Chapel. Muslim worship is also offered each Friday at the Cadet Interfaith Center. The Old Cadet Chapel serves as the meeting place on Sunday for Lutheran cadets. Other denominational groups meeting each week include Southern Baptists, Episcopalians, Church of Christ, and Church of Jesus Christ of Latter Day Saints.

Chaplains are quick to lend a sympathetic ear to the cadet who seeks individual guidance or counsel about personal and family problems or who simply wants to talk. The chaplains' offices in Washington Hall, hub of the cadet living area, make this kind of personal counseling readily available.

Religious groups such as the Officers Christian Fellowship and the Navigators are also active at West Point. The Fellowship of Christian Athletes meets weekly, where coaches and professional athletes are among the speakers. Company Bible studies and fellowship groups are also available throughout the week to all cadets.

Retreats are popular activities. Each cadet is authorized one religious retreat each semester. It may be a ski retreat with the Fellowship of Christian Athletes, the always-popular Plebe Retreat, a Teens Encounter Christ (TEC), or Vida Nueva (New Life) weekend that helps keep the cadet active in the spiritual community.

West Point's religious activities are as varied and as appealing as the cadets who participate in them. They provide a vital link with congregations and parishes back home as well as giving spiritual vitality during cadet life at West Point.



"The ultimate test of what truth means is the conduct it dictates or inspires."

William James

The mission of the Department of Military Instruction is to train, educate, and inspire the Corps of Cadets in the essence of warfighting and the Profession of Arms over the 47-month West Point Experience in order to develop competent future Army officers.

The academic year instruction and the summer training program complement and supplement each other in a logical and progressive sequence to achieve a smooth transition from civilian status, through four cadet years, to commissioning as a second lieutenant.

DEPARTMENT OF MILITARY INSTRUCTION

Through a robust and wide-ranging program of visits, guest lecturers, conferences, and exchanges, the Military Program at the academy continues to incorporate the latest changes in doctrine, strategy, and tactics resulting from the ongoing Army Transformation. The Military Training Program, Military Science classes, and Defense and Strategic Studies within the Military Program continue to provide the foundation upon which the graduate will be able to begin a career as a commissioned officer with confidence, competence, and dedication to service.

Cadet Basic Training, also called "Beast Barracks", is the beginning of the Military Training Program and the start of the 47-month West Point Experience. The mission of Cadet Basic Training (CBT) is to train, instruct, and develop new cadets in order to transition them from civilians to Soldiers and to build a foundation to develop leaders of character strongly committed to military service. CBT is an eight-week program of instruction that instills in cadets the principles of discipline, personal pride, confidence, and a sense of duty. New cadets are challenged physically with a rigorous physical training program that includes a series of challenging foot marches, obstacle courses, and combat-focused physical training. They are trained in a variety of skills including rifle marksmanship, mountaineering and 75-foot rappels, land navigation, and hand-to-hand combat. CBT ends with the DMI Challenge, a two-day training event that challenges new cadets to demonstrate their proficiency in select tasks trained during the summer. The new cadets finish their CBT experience with a 14-mile foot march – the "Marchback" – back to West Point, where they are welcomed by the rest of the Corps of Cadets.

All cadets complete the four-week **Cadet Field Training** (CFT) during their second summer at West Point. The purpose of CFT is to train Third Class cadets in advanced individual skills, small unit tactics, and leadership in order to create competent, confident junior leaders for the Army and to introduce cadets to the essence of our Army – winning the close ground fight. CFT also provides a powerful leadership experience that develops the leader skills and abilities of participating First and Second Class cadets. Of the numerous training events in which cadets participate during CFT, two of the key events are a block of Urban Combat Operations and a 48-hour Field Training Exercise (FTX). Urban Combat Operations training introduces cadets to the rigors of fighting an enemy entrenched in a complex environment of streets, structures, and civilians. Cadets are trained in the tactics, techniques, and procedures used to defeat enemy combatants based on current trends from Contingency Operations Overseas. Near the end of the CFT experience, cadets participate in a 48-hour FTX that reinforces all the training received during CFT. This event challenges them both physically and mentally to make tactical decisions in stressful, complex, and ever-changing realistic situations. Cadets participating in this training must demonstrate the fortitude expected of an Army officer to lead and inspire Soldiers to accomplish any assigned mission, regardless of the conditions.

Cadet Leader Development Training (CLDT) is an intensive three-week training program for rising First Class cadets executed during their fourth and final summer at West Point. CLDT focuses on the Army's Troop Leading Procedures and

leadership development during a 19-day tactical field training exercise. The training is modeled from the contemporary operating environment and lessons learned from units conducting combat operations in support of the Global War on Terror. Cadets conduct air assault operations, cordon and search, search and attack, mounted patrolling operations, platoon attack, and attack in an urban environment, and they conduct operations from a company combat outpost against an insurgent group hostile to host nation security forces. They gain an appreciation for cultural awareness through their interaction with Arabic-speaking role-players who replicate sheiks, imams, and other village/tribal leaders.

Core Military Science Courses

The Core Military Science (MS) curriculum is a critical component of the Military Program at the United States Military Academy that provides cadets the knowledge and skills necessary for continued cadet development and success as an Army officer. The curriculum allows cadets to study the Army profession during the academic year as a continuum of the Cadet Summer Training programs. This core program is taught by instructors from the Department of Military Instruction and is incorporated into the cadets' first three years. Each academic year builds upon the previous year's instruction so that each cadet matures in his or her Military Science knowledge and ability to think and communicate militarily.

MS100 Introduction to Warfighting

Second Term—Fourth Class cadets.

SCOPE: This course provides cadets with the foundation of military and tactical knowledge necessary for future field training and development in subsequent Military Science courses. Cadets learn fundamental Army unit organizations, capabilities, and missions, as well as an understanding of the roles of noncommissioned officers and officers. Cadets gain an understanding of the principles of war, troop leading procedures, the orders process, and capabilities and effects of squad-level weapon systems. The course emphasizes tactical planning and communication of plans using common operational terms and graphics in order to build tactical problem-solving skills at the small-unit level. Cadets who have successfully completed MS100, will understand their roles as Soldiers and will have demonstrated the ability to function effectively as members of a squad.

Objectives:

- Demonstrate an understanding of Army units at the company level and lower; know their composition, capabilities, and employment, and the roles of officers and noncommissioned officers within the Army's structure.
- Demonstrate an understanding of U.S. Army weapon systems, employment criteria, and effects on the enemy at the squad level (M249, M240, MK19, M203, M2). Additionally, cadets will demonstrate an understanding of the capabilities of foreign weapons (AK47, RPK, RPG, DSHK, DRAGONUV).
- Demonstrate the ability to apply the principles of war to tactical situations.
- Develop an understanding of tactical mission planning and communication of a plan at the squad and platoon levels, using the appropriate operational terms and graphics in order to build tactical problem-solving skills at the small-unit level.
- Through the application of the fundamentals of offensive and defensive operations, demonstrate the ability to framework a tactical problem and formulate a course of action.

1.5 Credit Hours

DEPARTMENT OF MILITARY INSTRUCTION

MS200 Fundamentals of Army Operations

First Term—Prerequisites: MS100 and Third Class cadet standing.

SCOPE: This course introduces cadets to the small-unit leader's role in the Army by developing the critical-thinking and problem-solving skills necessary for adaptive leaders in administrative, training, and tactical environments. Fundamentals of Army Operations builds upon the knowledge and experience cadets gain in MS100 and summer training. It explores Army leadership, troop-leading procedures, and small-unit operations in order to develop and hone decision-making skills. Throughout the course, cadets demonstrate their knowledge through a series of tactical decision exercises. Cadets who successfully complete MS200 possess fundamental tactical-planning and decision-making skills that prepare them for more challenging training in the field and in future military science courses.

Objectives:

- Demonstrate the ability to make tactical decisions under pressure with limited information and limited time.
- Identify and understand tactical mission tasks and purposes, and how to nest units' tasks and purposes.
- Effectively analyze terrain, weather, and enemy capabilities and examine how each affects military operations.
- Identify the principles behind small-unit tactics and apply them to mission planning.
- Describe and apply the troop-leading procedures, examine tactical mission planning, and effectively communicate that plan.

1.5 Credit Hours

MS300 Platoon Operations

Either Term—Prerequisites: MS100 and MS200 and Third Class cadet standing.

SCOPE: This course builds upon basic tactical planning and decision-making skills taught during MS200. MS300 further develops the cadet's knowledge of doctrinal and warfighting principles, general professional knowledge, and troop-leading procedures (TLPs) in order to instill an aggressive and flexible combined arms mentality. Cadets are challenged to apply knowledge, skills, and common sense to solve complex situations that require critical thinking and creative problem-solving skills. Instruction in the fundamentals of Army operations emphasizes both offensive and defensive tactics. Additionally, cadets are expected to demonstrate mental agility and an increased understanding of the TLPs through nearly daily execution of tactical decision-making exercises. In addition to tactics, cadets continue their general instruction in the various Army systems, procedures, and functions that are important aspects of officership. Finally, cadets examine the small-unit leader's role in ensuring that the moral and ethical decision-making process is integrated into all operations.

Objectives:

- Demonstrate the ability to make tactical decisions under pressure with limited information and limited time.
- Demonstrate an understanding of the fundamental principles that underlie Army doctrine and small-unit tactics and the ability to apply them to mission planning.
- Demonstrate the ability to effectively communicate a tactical course of action both verbally and visually.
- Demonstrate an understanding of how to apply troop-leading procedures to planning a tactical operation as a platoon leader.

1.5 Credit Hours

Defense and Strategic Studies Major (formerly Military Art and Science)

The Defense and Strategic Studies major is an interdisciplinary military studies curriculum that goes well beyond the academy's core Military Science education. The DSS major is offered through the Department of Military Instruction and is an excellent choice for cadets who wish to undertake a serious academic study of the Profession of Arms. These elective courses may be chosen from a wide interdisciplinary menu that includes advanced military science, history, social science, geography, law, and foreign language courses. Each course within the DSS major is weighted 3 credit hours in support of the academic program score. No credit is provided toward the military program score. Required courses and electives are listed below.

Required Courses

MS310 Tactics

Prerequisite: None.

SCOPE: This course introduces the cadet to tactics, the employment of units in combat, and military decision-making at multiple levels of command. MS310 presents the course material in three blocks of instruction: Block I, the Fundamentals of Tactics, focuses on the evolution of the art and science of tactics, as well as the doctrine governing U.S. Army tactics. Block II explores the various tactical environments of conventional units conducting conventional operations. Block III explores the tactical environments of conventional units confronted with irregular warfare (IW) environments. This block also highlights the

emerging importance and associated complexities of conventional units involved in Foreign Internal Defense (FID), also known as Military Transition Teams (MTTs).

3 Credit Hours

MS470 Military Strategy

Prerequisite: None.

SCOPE: This course provides an overview of how national security strategy is translated into effective military strategy. The course addresses three central issues: (1) the appropriate ends of military strategy, (2) the ways we use our military capabilities to achieve national objectives, and (3) the means applied to achieved desired strategic end states. The first part of the course focuses on strategic fundamentals to include enduring theoretical approaches to strategy and basic strategic principles. Next, we apply knowledge from the first part of the course to assess strategy through the detailed examination of historical case studies. Finally, we examine current U.S. strategic systems and how national-level strategy is synthesized into effective theater-level military strategy. This includes examination of the roles and responsibilities of the various combatant commands, the examination of regional strategic issues and how our military addresses those issues, as well as the limitations of military force in the 21st century security environment.

3 Credit Hours

Elective Courses

MS345 Army Transformation

Prerequisite: None.

SCOPE: This interdisciplinary course examines the subject of military innovation or transformation from a theoretical, historical, and policy-oriented perspective. Using the U.S. Army as the primary object of inquiry, the course addresses several key questions: Why do militaries innovate? How does this process of innovation occur? Why do attempts at military innovation succeed or fail? The first course block introduces competing theoretical explanations that provide a framework for understanding military innovation at the systemic, state, and organizational levels of analysis. Block two of the course examines several historical cases of U.S. Army transformation in the 20th century and their effect on the U.S. Army today. The final course block analyzes the U.S. Army's current attempts at transformation. This block explores the possibility of a recent revolution in military affairs and considers the dilemmas of future U.S. Army transformation given emerging technology, current operational requirements, and the international security environment.

3 Credit Hours

MS350 Military Communication

Prerequisite: None.

SCOPE: MS350 is a communication course grounded in application of sound communication techniques relevant to the tactical and strategic levels of war as well as communication techniques applicable for the proper delivery and reception of messages in a professional organization. Cadets learn to better communicate from the battlefield to the boardroom and beyond by conducting at least five presentations, press interviews for print, and battlefield communication exercises.

3 Credit Hours

MS360 Special Operations and Low-Intensity Conflict

Prerequisite: First and Second Class cadets only.

SCOPE: This course is subdivided into two sub-courses: The first sub-course examines the class of military operations commonly referred to as "Low-Intensity Conflict" (LIC). It explores the nature and dynamics of LIC, with particular attention paid to the differences between LIC and conventional mid- to high-intensity conflict. Specifically, cadets examine insurgency and counterinsurgency, international terrorism, and peacekeeping operations, as well as strategy and tactics appropriate for each. The second

sub-course examines Special Operations Forces (SOF). The sub-course explores the unique methods of special operators and the close relationship between SOF and LIC. Cadets will examine how U.S. Special Operations Forces are organized, how special operations in general succeed, and why SOF are particularly well-suited to LIC. Several subject-matter expert guest speakers are integrated into the instruction throughout the course.

3 Credit Hours

MS385 Sustaining the Force

Prerequisite: None.

SCOPE: This course introduces cadets to the principles of logistics and the critical factors that affect sustaining military operations. The first block focuses on the principles of logistics and characteristics of logistical support, identifying the fundamentals of logistical planning of both tactical missions and expeditionary operations. The second block focuses on sustaining combat operations at the tactical level of war, applying the principles of logistics to military operations from the perspective of both mounted and dismounted junior leaders. The third block of instruction focuses on case studies, examining operations in which logistics led to success or failure on the battlefield. The cadet will leave the class with an understanding of the fundamentals of logistical planning and an understanding of the challenges of sustaining units in combat. Students will be equipped to conduct doctrinal analysis of the logistical planning and execution of past military operations and to identify the aspects of sustainment that contributed to victory or defeat.

3 Credit Hours

MS455 Comparative Military Systems

Prerequisite: None. Special requirements: Research paper and oral presentation.

SCOPE: The course objective is to analyze the defense policies of various countries and the outcomes of those defense policies in the form of national security and military objectives, military doctrine, force structure, and capabilities. Countries studied include actual and potential coalition partners or adversaries. Cadets examine the political, economic, and social influences on each military establishment. Additionally, the course looks at the cultural influences on the development and implementation of the defense policies assessing the effects on missions, structure, roles, and capabilities of the military. Cadets develop their own framework of analysis to critically evaluate the defense polices and cultures of other countries, and will be able to clearly articulate that analysis through written and oral means. Guest speakers include liaison officers and foreign area officers to provide insight into the specific military establishments of those countries studied.

NOTE: This course is also included in majors offered by the departments of Social Science, Geography, Foreign Languages, and Environmental Engineering, and, to a lesser degree, in the Military History major.

3 Credit Hours

MS460 Counterinsurgency

Prerequisite: None.

SCOPE: This course exists in order that cadets will 1) demonstrate a theoretical and pragmatic understanding of insurgencies, to include their temperaments, composition, strategies, employment, and irregular battlefield operating systems; 2) demonstrate a theoretical and pragmatic understanding of counterinsurgency operations and the interrelationships between the environment, operations, enemies, and strategies; 3) demonstrate a command of historical U.S. counterinsurgency doctrinal concepts, how they relate to theory and strategy, where they are inadequate, and where they are beneficial; 4) demonstrate sound analysis and application of key course concepts using historical case studies; and 5) improve oral and written communication skills. This course begins broadly and then narrows in order to integrate theory and strategy with tactics and practicality. The first sub-course introduces the insurgency, an understanding of which is essential to leading, organizing, and implementing successful operations against it. In the second sub-course, students examine counterinsurgency operations from theoretical, strategic, operational, tactical, and practical perspectives. The final sub-course presents three historical case studies intended to engage each student's learning with both analysis and application through oral and written means.

3 Credit Hours

MS489 Advanced Military Studies in Defense and Strategic Studies

Prerequisite: Approval of DMI director; open only to First Class cadets.

The course provides an environment that is conducive to independent effort in a subject area of special interest to the cadet. Original research or specialized study can be accomplished in any topic within Defense and Strategic Studies. The course is conducted in three phases: First, the cadet and the individual advisor from the Defense and Strategic Studies faculty reach agreement on a subject area of research, and research methods are studied under the direction of the faculty member. Research may involve field trips and personal interviews with experts in the area of study. In the second phase, the cadet engages in independent research and prepares a draft analytical paper or report detailing the findings. During this period, frequent consultation with the faculty advisor occurs regarding the progress in the project. In the third phase, the cadet presents and defends the findings before a faculty committee.

3 Credit Hours

MS498 Colloquium in Military Affairs

Prerequisite: Approval from the Director of DSS.

SCOPE: The colloquium uses seminar discussions to analyze and debate issues of command and leadership, as well as the linkage of strategic, operational, and tactical objectives in historical and current military operations. Cadets apply the fundamentals learned through previous instruction in strategy, logistics, intelligence, tactics, and irregular warfare to historical campaigns as well as current military operations. Books and selected readings will expose cadets to commanders with different leadership styles, providing them the basis for discussion and encouraging individual study of command and leadership. Cadets will also begin or continue to gain greater insight into their own personal philosophies of command and leadership. Topics may vary each year in accordance with cadet interest and faculty expertise.

3 Credit Hours

THE WILLIAM E. SIMON CENTER FOR THE PROFESSIONAL MILITARY ETHIC

The center leads programs that assist each cadet in synthesizing experiences and inspiring personal ownership of a self-identity as a future officer. It supervises the Honor and Respect committees and develops and executes outreach initiatives to the Army and to civilian colleges/universities. It sponsors research, writing, and teaching about the Professional Military Ethic.

The William E. Simon Center for the Professional Military Ethic (SCPME) in the United States Corps of Cadets traces its origins to the very early 1900s and the traditions that guided cadet life informally with the Corps of Cadets for the first hundred years of the academy's existence. In 1922, Academy Superintendent General Douglas MacArthur established the Cadet Honor Committee and formalized the Honor Code: "A cadet will not lie, cheat, or steal, or tolerate those who do." Following a 1976 cheating scandal, the academy adopted recommendations from a commission led by former Apollo 8 astronaut and academy graduate Colonel (Ret.) Frank Borman. The superintendent established commissioned officer oversight of the Cadet Honor Committee with appointment of a Special Assistant to the Commandant for Honor Matters. In 1992, the Respect for Others Program became the second bedrock value espoused by the academy. The Commandant of Cadets established a Cadet Respect Committee responsible for cadet human relations issues, with officer oversight provided by a Special Assistant to the Commandant for Respect. In 1998, the Commandant established the Center for the Professional Military Ethic (CPME) with the support of both the Army and the academy's leadership and the generous financial support of numerous individual and corporate donors.

The Center for the Professional Military Ethic was charged with bringing a new cohesiveness to the moral-ethical training of cadets. While the Cadet Honor Code and the motto, "Duty, Honor, Country," provide the underpinnings of cadets' moral ethos, the academy leadership established the center to deepen cadets' understanding of the Professional Military Ethic and better coordinate the ethical development programs across the academy curriculum. The center also has been charged to serve as the academy focal point for developing a professional concept of "Officership" within the Corps of Cadets.

In November 2000, the Center for the Professional Military Ethic was formally dedicated to the memory of former Secretary of the Treasury, business leader, adventurer, and philanthropist William E. Simon. The Simon Center for the Professional Military Ethic is a visible and daily reminder to cadets of their commitment to integrity and ethical behavior, located in the newly renovated First Division Barracks in the heart of the cadet area at West Point.

The Simon Center of the Professional Military Ethic has benefited significantly from the generous donations of many West Point graduates and classes that have funded programs within the center. For example, the William E. Simon Foundation Endowment Funds sponsor the majority of the ethics programs, conferences, and events for SCPME. The Visiting Scholar and the Battle Command Conference is sponsored by the West Point Class of 1966 in conjunction with the Bradley Foundation and the Norman R. Augustine Endowment. The West Point Class of 1970 sponsors the annual National Conference on Ethics in America (NCEA), which focuses on character, leadership, and integrity in college, the professional world, and beyond; the annual conference attracts more than 180 students and 40 faculty members from 80 different colleges and universities, including all the U.S. service academies. The West Point Classes of 1939 and 1941 support the fall and winter Professional Military Ethic Education (PME2) Conferences each year, where cadets and faculty unite and plan for the upcoming Character Education Curriculum for cadets. The Class of 1957 dedicated the Honor Plaza, which showcases the history of the Cadet Honor Code in a very impressive and inspiring public area. The Nininger Hall Historic Museum rooms were sponsored by the West Point Classes of 1930, 1939, 1951, and 1960, and Nininger Hall upkeep is sponsored by the West Point Class of 1941. The West Point Class of 1969 is currently raising reunion year funds to support the funding of the Professor of Officership position.

The Simon Center for the Professional Military Ethic:

The mission of the Simon Center for the Professional Military Ethic is to supervise the Honor / Respect Programs and develop, coordinate, and integrate curriculum and other activities within West Point on the Professional Military Ethic to promote an understanding of Officership and the development of a professional self-concept within all graduates. The Simon Center:

- Develops, coordinates, assesses, and integrates West Point programs that contribute to the development of a professional self-concept in cadets through Professional Military Ethic Education.
- Supervises Cadet Honor and Respect Programs.
- Serves as the Army Center of Excellence for the study of Officership and Continuing Education in the Professional Military Ethic.
- Conducts outreach to expose external organizations to the West Point character-development programs.
- Assists the United States Corps of Cadets (USCC) major subordinate commands in the education and training of military and civilian faculty and staff on equal opportunity-related issues.
- Conducts research of the Professional Military Ethic, including review of current content and the development and integration of new resources and programs, in order to ensure a comprehensive education for leaders.

The Simon Center is organized around four principal programs: The Honor Program, the Respect Program, the Center for Officership, and the Professional Military Ethics Education (PME2) program.

HONOR AND RESPECT PROGRAMS OF EXCELLENCE

"He who feels the respect which is due to others cannot fail to inspire in them regard for himself, while he who feels, and hence manifests, disrespect toward others, especially his inferiors, cannot fail to inspire hatred against himself."

Major General John M. Schofield

The Honor Program

"Duty, Honor, Country. Those three hallowed words reverently dictate what you ought to be, what you can be, what you will be. They are your rallying points."

General Douglas MacArthur spoke these words to the Corps of Cadets May 12, 1962, in his farewell address to West Point. The Cadet Honor Program is the very core of the United States Military Academy. It develops a cadet's character through a 47-month experience. The program's foundation is the Cadet Honor Code, which states "A cadet will not lie, cheat, steal, or tolerate those who do."

The honor code is administered by the Cadet Honor Committee. Its members are elected by their peers and appointed for two years. They are responsible for the education of the standards and requirements of the honor code, its system and procedures.

The Respect Program

"Not all leader issues are respect issues, but all respect issues are leader issues."

For generations the United States Military Academy has advocated respect for others as an integral part of leadership and inherent to the ethos of the professional military officer. The ability to educate, train, and inspire leaders of character is linked to the academy's commitment to ensuring a positive command climate, eliminating discrimination, and fostering an atmosphere in which cadets can learn and develop equally without prejudice. In order to ensure a healthy command climate and focus more succinctly on character development, West Point maintains the Respect Program. The intent of the program is to engender a professional attitude that encompasses every aspect of cadet life and that is essential for effective leadership in the Army.

The United States Army and the United States Military Academy will not tolerate violations of equal opportunity (prejudicial and discriminatory behavior or unfair treatment based on race, religion, national origin, color, or gender). One function of the Respect Program is to bring awareness to and educate cadets on equal opportunity issues. The program fosters cadets' understanding of and commitment to the fundamental principle that each individual intrinsically has infinite dignity and worth.

THE CENTER OF EXCELLENCE FOR OFFICERSHIP AND THE PROFESSIONAL MILITARY ETHIC

The Visiting Scholar Program

The Visiting Scholar program is integral to the operation of the Center and its programs. Currently the position is held by Gen. (Ret.) Frederick M. Franks. The visiting scholar advises the director on the program of instruction designed to develop a self-concept of the Professional Military Ethic within the Corps of Cadets. He also assists the Army, other services, and appropriate national institutions on leadership doctrine and education relating to the Profession of Arms and scholastic integrity. The visiting scholar is also directly responsible for course design and instruction of the MS497 Battle Command course, which is a First Class elective designed to integrate all elements of a cadet's development focused on command in battle.

The Professional Military Ethics Education (PME^2) Program

The purpose of Professional Military Ethic Education is to provide cadet facilitated instruction focused on reinforcing the Cadet Leadership Development System outcome goals. PME2 is designed to reinforce current academy programs, assist in developing the self-concept of officership, and instill the ethos of the American Military Profession. The curriculum is a mixture of small group discussion, online scenarios, reflective reading and writing assignments and guest lectures. The PME2 program is flexible and designed to complement cadet education in three fundamentally important areas in the development of leaders of character: values education, officership, and leader skill development.

The Department of Physical Education develops warrior leaders of character who are physically and mentally tough by engaging cadets in activities that promote and enhance the warrior ethos and lifelong physical and functional fitness. The physical program helps future leaders develop motor skills, self-confidence, respect for fair play, and a commitment to maintaining individual and unit physical fitness. The Department of Physical Education develops leaders of character through a coordinated, challenging, and safe physical education and fitness experience.

DEPARTMENT OF PHYSICAL EDUCATION

CHAPTER 7

The Physical Education Core Program consists of:

- Basic Instruction skills classes (Survival Swimming, Boxing/Fundamentals of Combatives, Military Movement, Combat Applications).
- Personal and unit fitness instruction.
- Lifetime physical activity skills and knowledge.
- Fitness assessment to determine individual status and progress.
- A compulsory competitive sports program for all cadets.

The Physical Education curriculum is integrated with the cadet summer training program and the competitive sports program to provide all cadets a physical-development experience unmatched in the United States.

During the first year of physical education, cadets must strive to achieve a baseline of movement skills, physical fitness, knowledge, and self-confidence necessary to meet the future physical requirements of the United States Military Academy and the Army. All cadets are required to pass the following core courses: PE117 Military Movement, PE115 Fundamentals of Combatives (women only), and PE116 Boxing (men only).

During the second year of physical education, cadets enhance physical readiness, self-confidence, and physical fitness. Enrollment in one lifetime physical activity course is mandatory for all cadets. The Lifetime Physical Activity program, PE212-251, is designed to develop a foundation of skills, knowledge, and personal attributes that will enable cadets to successfully participate in lifetime sports, provide motivation for continued improvement, and establish a pattern of physical activity for a lifetime. Cadets will also take PE215 Fundamentals of Fitness that provides the knowledge and experience to develop a personal fitness plan based on the Army doctrinal approach to physical readiness.

The third year of physical education affords cadets the opportunity to take PE360 Army Combat Applications and PE320-323 Survival Swimming. PE360 enhances cadets' personal fitness, warrior ethos, and leadership skills by providing a comprehensive set of basic combatives skills suited for a combat scenario. Cadets will learn to respond appropriately to aggression by utilizing proper body mechanics, skills, aggressiveness, and fear management. PE320-323 Survival Swimming is designed to develop aquatic proficiency with emphasis on the military applications of swimming and survival skills, to include breath control, buoyancy positions, stroke assessment, and swimming endurance.

During the fourth year of physical education, cadets take PE450 Army Fitness Development which prepares future company grade officers for their role as fitness leaders by equipping them with the knowledge to plan, implement, and assess unit physical training in a variety of conditions and by giving them opportunities to apply this knowledge.

In addition to the instructional coursework, every cadet must participate in a competitive sport (company squad, club squad, or corps squad) during each academic term. Additionally, Second Class cadets must pass the Indoor Obstacle Course Test.

Baseline requirements are established for all cadets. The objective is for all cadets to share the same physical development experience in a cadet-centered environment. All cadets are required to complete and pass core instructional courses and physical fitness assessments, and also participate in competitive sports during each academic term.

Required Core Courses

PE109 Fundamentals of Aquatics

Prerequisite—Selected cadets only.

Fundamentals of Aquatics is an introductory swimming exploration program designed to prepare non-swimmers for success in PE110 Survival Swimming/Elementary. The program is arranged sequentially to help cadets acquire in-water experiences, and gradually refine the basic motor skills needed to be comfortable, safe, and effective while engaged in and around the aquatic environment.

.5 Credit Hour

PE115 Fundamentals of Combatives (Women)

This is an entry-level course in which women are introduced to an integrated set of basic self-defense skills and the strategies and tactics necessary to avoid, escape, or break a physical assault. Course content includes methods of falling, stances, movement, striking, kicking, and blocking skills. Women are evaluated on the application of these skills to structured self-defense scenarios. This course enables a woman to protect herself in the role of Soldier in time of conflict and as an individual in today's society.

.5 Credit Hour

PE116 Combatives II: Boxing (Men)

This is a course in which the offensive and defensive skills of amateur boxing are taught. Course content includes stances, movement, basic punches (i.e. jab, cross, hook, and uppercut), defenses, strategies, and tactics. Instruction on refereeing, judging, and serving as a corner second are presented. Boxers are evaluated or assessed and provided feedback on the ability to box. The course exposes participants to the coping strategies necessary to deal with a physical threat.

.5 Credit Hour

PE117 Military Movement
Military Movement exposes cadets to a variety of basic movement skills. The course serves as a basis for many other athletic and military activities that cadets will encounter during their time at USMA as well as in their Army careers. Focus is placed on applied movement tasks for all cadets. This course takes a basic movement theme approach, meaning cadets are required to learn a variety of relevant skills from within the general themes of rolling, hanging, climbing, crawling, jumping, vaulting, landing, mounting, supporting, and swinging. Movement environments are designed around specific events such as tumbling, vaulting, vertical ropes, horizontal ropes, indoor obstacle course, horizontal bars, elephant vault, ankles to the bar, pull-ups, and trampoline.

.5 Credit Hour

PE212-251 Lifetime Sports
The Lifetime Sports Program is designed to develop a foundation of skills, knowledge, and personal attributes, which will enable cadets to successfully participate in lifetime sports, provide motivation for continued improvement, and establish a pattern of physical activity for a lifetime. Enrollment in one lifetime sport is mandatory for all Third Class cadets.

.5 Credit Hour

PE215 Fundamentals of Fitness
This course provides cadets with the knowledge and experience to develop a personal fitness plan based on the Army doctrinal approach to physical readiness. Cadets will participate in a variety of active learning experiences designed to develop, monitor, maintain, and assess physical fitness for their future Army careers and lifetime of physical activity.

1.5 Credit Hours

PE320-323 Survival Swimming
The Survival Swimming course is designed to develop aquatic proficiency. The program of instruction is divided into two areas: basic swimming and combat/survival swimming. Emphasis in all levels is on the military applications of swimming and survival skills, including the elements of breath control, buoyancy positions, stroke assessment, and swimming endurance. Grading is primarily based on criterion-referenced scales in basic and survival swimming skills.

.5 Credit Hour

PE360 Army Combat Applications
Army Combat Applications exposes cadets to a comprehensive set of unarmed combat skills, and the strategies and tactics needed to neutralize a physical attack. Responses to striking, kicking, joint locking, choking, throwing, and ground grappling attacks are taught with an emphasis on submission holds applied on the ground as finishing techniques. The course is designed to increase cadets' confidence in their ability to defend themselves from all forms of striking and grappling attacks and to foster the development of a combat-survival mindset. Cadets are evaluated on their demonstration of required skills and their performances in simulated combat/self defense scenarios.

.5 Credit Hour

PE450 Army Fitness Development
This course prepares future company grade officers for their role as fitness leaders by equipping them with the knowledge to plan, implement, and assess unit physical training in a variety of conditions and by giving them opportunities to apply this knowledge.

1.5 Credit Hours

The Kinesiology Major
Kinesiology is the study of the physiological, psychological, and mechanical aspects of human movement. The Kinesiology major is a scientifically based, interdisciplinary field of study that includes content in exercise physiology, biomechanics, sports medicine, sports nutrition, exercise psychology, exercise epidemiology, etc. Areas of inquiry range in scope from the study of the molecular response of cells to the response and adaptation of the whole body. The Kinesiology major covers a wide spectrum of performance issues involving muscular and cardiovascular physiology, energy balance, exercise adherence, and neuromuscular control overload, capacity, and energy. The Kinesiology major is applicable to a myriad of Army missions.

KN355 Functional Anatomy
This course is designed to provide cadets with a detailed study of basic human anatomy and causal relationships between skeletal muscles and structures and the science of human movement.

3 Credit Hours

KN360 Biometrics of Human Movement
This course is designed to provide cadets with a basic understanding of the biomechanical analysis of movement. Cadets will study human motion through the examination of forces acting on the body and the effects produced by these forces. Applications in exercise, sport, rehabilitation, and occupational settings will be explored.

3 Credit Hours

KN365 Nutrition for Performance
This course is designed to provide a broad foundation and understanding of the metabolic aspects of human performance. A variety of topics will be discussed to assist the cadets' understanding of the systematic nature of exercise metabolism. Additional several peer-reviewed journals will be utilized to expose students to applied research and assist with the understanding of exercise metabolism.

3 Credit Hours

KN455 Psychology of Exercise
This course is designed to introduce cadets to the psychology of physical activity and exercise. It starts by providing definitional clarity of terms and concepts associated with exercise, as well as a review of the generally accepted guidelines for physical activity, the components of health-related fitness, and the principles of exercise.

3 Credit Hours

KN460 Exercise Physiology
This course is designed to provide a broad foundation and understanding of the physiological aspects of human performance. Specific laboratory assessments will be utilized to assist in the understanding. Peer-reviewed journal reviews will be utilized to expose students to applied physiological research and assist with the understanding of human performance physiology. The capstone project will include a comprehensive physiological self-profile utilizing both field and laboratory assessments.

3.5 Credit Hours

KN465 Motor Control and Learning
This course will present the principles underlying the control and learning of motor skills. Central, neural, and sensory mechanisms that facilitate or inhibit the production, control, acquisition, retention, and transfer of motor skills will be discussed. Emphasis is given to a sound theoretical base from which to design and implement optimal

DEPARTMENT OF PHYSICAL EDUCATION

learning and performance conditions. Motor control variables such as motor programs, brain systems, the spinal cord, musculoskeletal factors, and visual systems are explored. Motor learning/performance variables such as transfer, modeling, feedback, practice schedule, mental practice, memory, and attention will be discussed. The course employs lecture, labs, group activities, and research methods to understand motor learning principles.

3 Credit Hours

KN470 Fitness Assessment and Prescription

This course was designed to develop cadets' understanding of the scientific principles of fitness assessment and exercise prescription. Following a comprehensive review of the literature, cadets will utilize a small group format to design and monitor a comprehensive exercise prescription. Specific laboratory assessments and equipment will be utilized to assist in the understanding and data collection. Peer-reviewed journals and training manuals will be utilized to expose cadets to the myriad of exercise prescription programs.

3 Credit Hours

KN480 Theory and Practice of Advanced Performance

This integrative experience course was designed to provide cadets with advanced content knowledge in human adaptation to exercise and to serve as the USMA Integrative Experience. KN480 will address the overarching academic program goal: "to anticipate and respond effectively to the uncertainties of a changing technological, social, political, and economic world."

3 Credit Hours

KN485 Topics: Exercise/Sport Science

This course provides in-depth study of a special topic in exercise and sport sciences not offered elsewhere in the USMA curriculum. Course content will be based on the special expertise of the Visiting Professor, Rotating Ph.D., or a senior DPE faculty member.

3 Credit Hours

KN494 Research Methods and Data Analysis (Honors)

This course is designed to survey the basic types of analytical, descriptive, and experimental research methods often found in exercise science research to help cadets understand the systematic nature of problem solving. Cadets will also learn to analyze, interpret, and apply exercise science data. Cadets will survey a variety of statistical procedures: descriptive, inferential, and correlational. Emphasis will be given to analyzing and interpreting data from a research perspective.

3 Credit Hours

KN495 Honors Thesis

This course provides Kinesiology majors with an opportunity to enhance their skills in clinical research and analysis. Under the supervision of a thesis advisor, cadets will implement the research proposal developed in KN494. Cadets will meet regularly as a group with their seminar advisors to discuss issues in design, methodology, and data analysis. At the end of the semester cadets will present their findings and defend their theses before a committee of faculty and fellow students.

3 Credit Hours

Competitive Sports

Company Squad

"Upon the fields of friendly strife are sown the seeds that upon other fields, on other days, will bear the fruits of victory." Those famous words, spoken by General Douglas MacArthur, set the tone for the company athletics program administered by the Department of Physical Education. Every Monday through Thursday the "fields of friendly strife" are flooded with company athletes. Each cadet competes in company athletics twice weekly. Company athletics provide every cadet a chance to build character, leadership, esprit de corps, and fitness as well as relax, reduce stress, and have fun. Fall, winter, and spring offerings include sports such as basketball, biathlon, grappling, handball, flickerball, football (tackle/flag), rugby, soccer, wrestling, volleyball, swimming, and ultimate Frisbee.

Competitive Club Squad

Competitive club squads complement the company athletics and intercollegiate athletic programs. Cadets who desire to compete at a higher level than the company athletic program are offered the opportunity to compete on one of the 23 different competitive clubs. These competitive teams, which are sponsored by the Department of Physical Education and funded by the Directorate of Cadet Activities, compete against other club, college, and university teams on a seasonal basis.

Many of these teams are among the best in the country. The men's and women's team handball, sport parachute, fencing, and orienteering teams won national championships in 2007. The boxing, men's rugby, women's rugby, and judo teams consistently rank in the top four in the country. Athletes annually earn national recognition in sports such as judo, sport parachute, martial arts, powerlifting, boxing, equestrian, fencing, sailing, crew, volleyball, mountaineering, marathon, women's lacrosse, water polo, triathlon, freestyle wrestling, skiing (Nordic and Alpine), and cycling. Many teams, such as the boxing and team handball teams, qualify athletes to compete on United States teams in international competitions, including the Olympics.

In most club sports cadets are leaders and planners as well as participants. As such, they are afforded the unique opportunity to further develop leadership and organizational skills in preparation for officership.

Throughout the four-year experience, cadets are required to participate in competitive sports as either a corps squad, club squad, or company squad athlete. During the summer months cadets are challenged to provide physical training and leadership during their military training at Cadet Basic Training and Cadet Field Training. The summers also afford options for cadets to participate in Physical Individual Advanced Development opportunities. Upon completion of the four-year PE program, the physically educated cadet is prepared to become a leader of character committed to a healthy lifestyle.

Competitive Club Squads

Crew (M/W)	Cycling
Triathlon	Equestrian
Volleyball	Fencing
Lacrosse (W)	Boxing
Marathon	Martial Arts
Orienteering	Judo
Rugby (M/W)	Powerlifting
Skiing (Alpine)	Water Polo
Skiing (Nordic)	Sailing
Sport Parachute	Team Handball (M/W)
Mountaineering	Freestyle Wrestling

The athletic program is an essential part of the total West Point Experience.

Mission

The mission of the Office of the Director of Intercollegiate Athletics (ODIA) is to contribute to the achievement of the USMA physical program goals by providing cadets the opportunity to compete at their highest level of ability in an array of competitive intercollegiate athletic teams that emphasize winning championships, leadership development, and character growth.

OFFICE OF INTERCOLLEGIATE ATHLETICS

ODIA Goals

- Reinforce the cadet-athlete commitment to excellence in academic, military, and physical programs.
- Provide a broad array of competitive opportunities and field competitive teams at the highest level compatible with other USMA programs.
- Achieve excellence and develop leaders of character through spirited competition, fair play, thorough preparation, teamwork, dedication, and self-sacrifice.
- Support the concept of equity for all teams and cadet-athletes.
- Comply fully with the letter and spirit of NCAA legislation.
- Operate a financially sound athletic program.

Every Cadet an Athlete

The athletic program is guided by the dictum, "Every cadet an athlete, every athlete challenged." Every cadet at West Point competes in intercollegiate, club or intramural sports. In addition, each cadet participates in the physical education program. The value of athletic experience to the potential Army officer has long been recognized. General Douglas MacArthur, superintendent shortly after World War I, was largely responsible for establishing the first-rate athletic program of the U.S. Military Academy. MacArthur's view was that "The training on the athletic field, which produces in a superlative degree the attributes of fortitude, self-control, resolution, courage, mental agility, and of course, physical development, is one completely fundamental to an efficient soldiery." The success of West Point's academic, athletic, and military training programs is well documented. The four-year graduation rate for all cadets (as well as cadet-athletes) remains stable at a very commendable 82 percent each year.

Intercollegiate Athletics

General MacArthur's feelings regarding the position athletics holds within the overall training of the cadet takes on special meaning with a look at some of the distinguished graduates who earned the coveted Army "A" while at West Point. Among them are former President and General of the Army Dwight D. Eisenhower, General of the Army Omar N. Bradley and General James A. Van Fleet.

Former Army football stars Felix "Doc" Blanchard, the late Glenn Davis, and Pete Dawkins all earned the coveted Heisman Trophy, an award presented annually to the best college football player in the nation. Dawkins, who retired from the U.S. Army in 1983 with the rank of Brigadier General, was captain of the football squad, class president and First Captain of the Corps of Cadets, the highest leadership position for cadets at West Point. He was also a Rhodes Scholar and the youngest man ever named to the National Football Foundation Hall of Fame.

"There are a thousand reasons for failure, but not a single excuse."

Mike Reid, Football Player

In recent years, the number of intercollegiate varsity sports has leveled off at 25, of which men may participate in 16 and women in 10 (with rifle qualifying as West Point's lone co-ed sport). More than one-quarter of the entire Corps of Cadets compete on the intercollegiate level.

In February 2000, ODIA's athletic program was presented with its NCAA certification, signifying that the program remains in substantial conformity with NCAA guidelines.

Eighteen of West Point's 25 sports teams compete in the Patriot League. The Patriot League was founded on the principles of maintaining teams of athletes whose academic ability and progress are representative of the entire student body, awarding athletic scholarships on the basis of need, and holding institutional presidents directly responsible for governance and policy.

West Point's football program competes as an independent. Football continues to generate most of the national interest for the intercollegiate athletic program at West Point. Historic Michie Stadium has long been recognized as one of the premier college football venues in the nation. In 1999, the editors of Sports Illustrated cited Michie Stadium as their third most-favorite sporting venue, behind Yankee Stadium and Augusta National Golf Course. Visitors from a four-state region of New York, New Jersey, Connecticut and Pennsylvania consistently flock to the banks of the Hudson on football Saturdays to be a part of the splendor of an Army Football game day. Sellout crowds are a custom at Michie Stadium, where football is only part of a day spent immersed in tradition and history. The Black Knights compete at the Division I-A level in football and play a national schedule that includes foes such as Texas A&M, Texas Christian University, and Notre Dame as well as the annual service academy battles with Air Force and Navy.

In the fall, Army also fields intercollegiate squads for men in soccer, cross country, and sprint football, while the women are active in cross country, volleyball, and soccer. With the exception of sprint football, which competes in the Eastern Sprint Football League, and varsity football, all other fall sports are members of the Patriot League.

The winter months are the busiest, athletically, with 10 squads competing on the intercollegiate level. While men participate in basketball, hockey, gymnastics, rifle, indoor track, wrestling, and swimming, women are active in basketball, swimming, indoor track, and rifle. Army's hockey team, which competed as a Division I independent before joining College Hockey America in 1999-2000, now competes in the Atlantic Hockey League. Wrestling maintains its longtime membership in the Eastern Intercollegiate Wrestling Association, the gymnastics squad competes in the Eastern College Athletic Conference and rifle is a member of the Great American Rifle Conference. All others compete in the Patriot League. During the spring, Army teams compete in baseball, lacrosse, tennis, golf, and outdoor track on the men's level, while West Point sponsors women's sports in softball, tennis, and outdoor track. All spring teams are members of the Patriot League.

Athletics remains an essential part of West Point's mission to develop leaders of character for our nation's future..

The following is a list of intercollegiate athletic teams fielded by the academy.

FALL

Men	Women
Cross Country*	Cross Country*
Football	Volleyball*
Soccer*	Soccer*
Sprint Football	

WINTER

Men	Women
Basketball*	Basketball*
Gymnastics	Rifle
Hockey	Swimming*
Indoor Track*	Indoor Track*
Rifle	
Swimming*	
Wrestling	

SPRING

Men	Women
Baseball*	Outdoor Track*
Golf*	Softball
Lacrosse*	Tennis*
Outdoor Track*	
Tennis*	

** Denotes membership in the Patriot League.*

"The difference between a successful person and others is not a lack of strength, not a lack of knowledge, but rather a lack of will."

Vincent T. Lombardi,
Football Coach

Yes, cadets at West Point do have social lives! And, according to a recent Princeton Review, they're provided with the most robust co-curricular program in the nation. Simply put, the Directorate of Cadet Activities (DCA) provides the "fun" in a cadet's rigorous schedule. "All for the Corps!"

The mission of Cadet Activities is to significantly enhance the development of the United States Corps of Cadets militarily,

physically, academically, moral-ethically, and socially by providing organized, comprehensive, and diverse programs and facilities that provide for entertainment and extracurricular, recreational, cultural and social activities.

Over 70 percent of cadets participate in one of 115 cadet clubs, but all cadets are impacted by Cadet Activities. Whether they attend a performance at Eisenhower Hall Theatre, read their award-winning yearbooks, dine at Grant Hall, buy Army-Navy T-shirts, or lift their glasses at a class weekend event, they are participating in Cadet Activities' extensive social program, which is funded through their business operations and the efforts of the West Point Association of Graduates. All profits return to the Corps of Cadets.

Social Life

Though their schedules are demanding, cadets do find time to take advantage of the many social opportunities available to them. Cadets hold social functions in the ski lodge, the golf club, the quaint railroad depot, two lake cabins, the crew and sailing center, and even on West Point's boats on the majestic Hudson River.

Throughout the year, special weekends are held for each class, which include formal banquets, dances, and other activities to which guests are invited. Movies, plays, concerts, other live entertainment, and dances in Eisenhower Hall are common weekend activities. An annual spring fest – an outdoor festival with food, drink, games, and music – is also held.

DCA's restaurant facilities include Grant Hall, the 175-seat on-campus restaurant that serves breakfast, lunch, dinner, and snacks, and now also features a coffee/smoothie bar; the Firstie Club, the sports bar open nightly for senior cadets; the Jefferson Library Cafe, serving a wide variety of beverages and light fare; and a catering operation that provides the opportunity for cadets to hold official functions, company tailgates, and parties. Cuisine is prepared under the direction of our Culinary Institute of America-graduate chef.

DCA also manages two retail stores where cadets can shop for everything from school supplies to computers to brand-name clothing at discounted prices. The West Point Bookstore, located in Thayer Hall, provides cadets with not only the latest bestsellers, regularly bringing in top authors for book signings, but also serves as a much-needed snack spot in between classes. For-sale items also include cards, supplies, and gifts. The Cadet Store, located in Central Area, offers cadets an inexpensive means to purchase the finest in jewelry and clothing, and all their uniform items and other necessities.

The Arts

For more than 30 years, the stage of West Point's Eisenhower Hall Theatre – the second-largest theater on the East Coast – has hosted hundreds of top-name artists, major Broadway productions (Les Miserables, Miss Saigon, Rent, Aida, to name a few), and unique, large-scale, cultural entertainment (Stomp, Lord of the Dance, Boston Pops, and many more). Cadets are given the opportunity to

experience these world-class performances in our gorgeous hall, free of charge or at a discounted price. For more information about theater performances, please go to www.ikehall.com.

For cadets who prefer to be behind the stage, the Cadet Theatre Arts Guild provides an opportunity to demonstrate their talents. The group produces major productions each year at Eisenhower Hall Theatre, and the cadet crews also provide behind-the-scenes technical assistance required for the 20-plus visiting performers and attractions booked each year. For cadets interested in working in another capacity at the theater, the staff and ushers provide patron assistance at all performances.

The Class of 1929 Art Gallery in the Eisenhower Hall Theatre presents an ambitious series of visual art exhibitions. Typically, five or six exhibitions are featured during the academic season, giving cadets the utmost exposure to the visual arts.

Cadet Extracurricular Clubs

Operating under the Directorate of Cadet Activities, more than 116 different extracurricular clubs provide a wide variety of activities designed to enhance the athletic, recreational, hobby, academic, and religious interests of the individual cadet as well as provide direct support to both the Corps of Cadets and West Point.

"The real price of everything, what everything really costs to the man who wants to acquire it, is the toil and trouble of acquiring it."

Adam Smith

Athletic Teams

The Directorate of Cadet Activities supports 26 competitive sport teams, many of which have enjoyed regional and national honors. All offer cadets opportunities to experience competition in diverse areas.

The Hudson River provides training ground for the **Sailing** and **Crew** teams. Cadets explore the open roads of the Hudson Valley on the **Cycling**, **Marathon**, and **Triathlon** teams. The **Sport Parachute** team takes in the picturesque view from above. The area's natural terrain is also utilized by the **Orienteering**, **Mountaineering**, and **Skeet** and **Trap** teams. Winter snows are always a plus for the **Alpine** and **Nordic Ski** teams.

State-of-the-art facilities on post host several other teams, including **Boxing**, **Fencing**, **Judo**, **Women's Lacrosse**, **Martial Arts**, the **Combat Applications Program**, **Pistol**, **Powerlifting**, **Men's and Women's Rugby**, **Men's and Women's Team Handball**, **Men's Volleyball**, **Water Polo**, **Inline Hockey**, **Paintball**, and **Racquetball**. Horse stables in nearby Highland Falls provide training grounds for the **Equestrian** Team.

Hobby Groups

Cadets are afforded the opportunity to enhance their recreational interests through participation in one or more of the hobby groups available through extracurricular activities.

The **Flying Club** provides cadets an opportunity to train for a Federal Aviation Administration license or maintain previously acquired flying skills. Several other clubs, such as the **Fishing** and **Inline Hockey** clubs, focus on adventure and skill development. **The Chess Club**, **Close-Combat Team**, **Mountain Bike Club**, **Ski Club**, and **Whitewater Canoe Club** broaden the cadet experience.

Of equal interest are activities of other hobby groups such as the **Scuba Diving Club**. This club traditionally has enjoyed excellent diving off the coast of Florida during spring break.

Support Groups

Various support groups provide service to both the Corps of Cadets and West Point.

The **Cadet Glee Club** is one of the most well-known collegiate singing groups in

the nation. Their concert schedule often includes appearances throughout the United States and on national television. Many of their performances are on YouTube, including their live performance alongside Trace Adkins at the Academy of Country Music Awards in Las Vegas.

The **Rabble Rousers**, **Rally Committee**, **Mule Riders**, and **Cadet Band** form the nucleus of spirit support activity for the Corps of Cadets. These activities work together as a team in support of the many Army athletic competitions.

Operating the cadet radio station is only one aspect of **WKDT**. In addition to regular broadcasts, members of **WKDT** provide DJs for many of the cadet hops and radio coverage for many Army athletic events. Other musical organizations include the cadet **Pipes and Drums**, the cadet **Rock Band** organization, and the **Gospel Choir**.

Cadet publications include the award-winning **"Howitzer"** yearbook, **"Mortar"** magazine, **"The Circle in the Spiral"** literary journal, the **"Bugle Notes"** freshman handbook, the **West Point Calendar** and the **West Point Planner**. All offer cadets the opportunity to develop and extend writing, photographic, and graphic talents.

Many cadets step out of the West Point community to help in veterans' hospitals, juvenile correctional institutions, and young people's organizations. The **Cadet Scoutmasters' Council** works with local Boy Scout units and annually hosts a camporee, which draws more than 3,000 scouts from all over the Eastern Seaboard.

Academic Clubs

Cadets assimilate the literature and customs of foreign nations through language and cultural clubs. Participants in the **Arabic**, **Asian-Pacific**, **Chinese**, **French**, **German**, **Hebrew**, **Korean-American**, **Portuguese**, **Russian**, and **Spanish** language clubs engage in activities designed to provide a better understanding of the culture behind the spoken and written words. Taking trips, organizing cultural festivals, and hosting guest lecturers further this goal.

Cadet math and science clubs sponsor innovative projects, discussion groups, and field trips. Groups active in this category include the **American Chemical Society**, **Operations Research Society of America**, **Astronomy Club**, **Mathematics Forum**, and **Society of Physics Cadets**.

Cadets majoring in Engineering have the opportunity to go beyond the classroom to further their skills and education through participation in conferences, trips to research institutions, and membership in professional organizations. Engineering clubs include the **American Society of Engineering Management**, **American Society of Civil Engineers**, **Institute of Electrical and Electronics Engineers**, **Mechanical Engineering Club**, **National Society of Black Engineers**, and the **Society of Women Engineers**.

Scores of cadets participate in intellectually stimulating programs of the **Debate Council and Forum**. The **Debate Team** participates each year in national intercollegiate policy debate competitions across the nation. The **West Point Forum** prepares cadets for cadet conferences, UN forums, and trips to the nation's capital. The **Domestic Affairs Forum** hosts guest lecturers and conducts trips to discuss policy issues with lawmakers. The **Cadet Conference of U.S. Affairs** brings students from other universities and government officials to West Point to discuss major issues in American foreign policy with cadets.

The **Investment Club** provides an open forum for cadets to discuss financial issues, the stock market, and business management. Cadets are afforded the opportunity to speak with professionals in financial fields while on field trips. In addition, West Point hosts learned guest lecturers.

Religious Clubs

Several West Point clubs revolve around religious activities. Cadets actively participate in church singing groups and choirs, work in Sunday Schools, hold retreats, and support other religious activities and events. Clubs include the **Baptist Student Union**, **Cadet Catholic Folk Group**, **Catholic Chapel Choir**, **Catholic Sunday School Teachers**, **United Catholic Fellowship**, **Chi Alpha Christian Fellowship**, **Church of Christ**, **Fellowship of Christian Athletes**, **Jewish Chapel Choir**, **Latter Day Saints**, **Navigators**, **Officers Christian Fellowship**, and the **Protestant Chapel Choir** and **Sunday School Teachers**.

For more information about cadet club and activities, please visit the Cadet Activities website at www.allforthecorps.com.

Trace Adkins performs with the West Point Glee Club at West Point's Eisenhower Hall.

Cadets at West Point enjoy the unparalleled opportunities offered by Cadet Activities, but they also benefit from the support of the Family and Morale, Welfare and Recreation Division, an organization that exists to maintain the quality of life for Soldiers and their families at every permanent US Army post in the world.

FAMILY, MORALE, WELFARE & RECREATION (FMWR)

How many college campuses have ski slopes with downhill and cross-country skiing, tubing and snowboarding; 18-hole golf courses with driving ranges; equestrian facilities and trails; auto shops with lifts students can use for their cars; state-of-the-art bowling center; mountain lakes with swimming, boating, camping, and fishing? The United States Military Academy does! And all those facilities are maintained and operated by West Point FMWR.

And it's not just world-class facilities …

In addition to the wonderful recreational facilities FMWR maintains at West Point and worldwide – the "R" in "FMWR" – they also provide for the "F," "M" and "W" of Soldiers and their Families. FMWR offers everything from child-care facilities to financial counseling to a community library – everything needed to provide a caring, community atmosphere. FMWR even sponsors "BOSS" – Better Opportunities for Single Soldiers – which has activities and facilities for Soldiers without spouses to enjoy. Visit West Point FMWR's website – www.westpointmwr.com – for more information.

After graduation …

No matter where duty takes a Soldier, there's always a caring community waiting, courtesy of FMWR. After graduation, when, as officers in the US Army, West Point graduates are charged with the well-being of their troops, US Army FMWR will be there for support. Visit their website – www.armymwr.com – to see what they offer.

Administrative titles at West Point may differ from those at most colleges, but the responsibilities that go along with the titles are similar.

ADMINISTRATION, STAFF & FACULTY

CHAPTER 9

The superintendent, like a college president, heads West Point, and the chief of staff is the principal executive to the superintendent in all command matters, directing and coordinating the formulation of operating policies and implementation of decisions of the superintendent. The dean of the Academic Board, like a college dean of faculty, coordinates the activities of the academic departments and advises the superintendent on academic matters.

The commandant of cadets is the military equivalent of a dean of students, overseeing cadet government and supervising the military training of the Corps of Cadets.

The superintendent, dean, and commandant join the heads of academic departments; the directors of Admissions, Military Instruction, and Physical Education; and the Medical Activity commander, to form the Academic Board, which establishes standards for admission, academic performance, and a wide range of other educational and administrative policies. The faculty, composed primarily of Army officers, combines the wisdom and continuity of tenured professors and associate professors with instructors assigned to West Point for three or four years. Since 1815, a Board of Visitors, similar in function to a board of trustees, has annually reviewed West Point's curriculum, policies, and equipment and submitted recommendations to the president of the United States.

The staff and faculty listing that follows is updated as of the first semester of the 2011-2012 academic year.

SUPERINTENDENT

David H. Huntoon Jr., LTG: B.S., USMA; M.A., Georgetown University; M.S., U.S. Army Command and General Staff College.

USMA Staff

Chief of Staff

Charles A. Stafford, COL: B.A., USMA; M.S., U.S. Naval War College.

Strategic Communications

Maureen Fitzgerald: Director; B.A., University of Maryland.

OFFICE OF THE DEAN

Dean of the Academic Board, Professor

Timothy Trainor, BG: B.S., USMA; M.B.A., Duke University; Ph.D., North Carolina State University.

Vice Dean for Education

Jean R. S. Blair, Dr.: B.S., Allegheny College; M.S., Ph.D., University of Pittsburgh.

Director of the Dean's Staff

Thomas M. Kastner, COL: B.S., USMA; M.S., Rensselaer Polytechnic Institute; Ph.D., Georgia Institute of Technology.

Academic Affairs Division

Bruce E. Keith, Dr.: Professor and Associate Dean; B.A., M.A., Western Washington University; Ph.D., University of Nebraska.

Thomas P. Judd, Dr.: Assistant Professor and Assistant Dean for Academic Assessment; B.A., Gettysburg College; M.A., Ed.D., Teachers College, Columbia University.

David A. Horan: Assistant Dean for Curriculum Management; B.S., Georgetown University; M.P.A., Troy State University.

International Intellectual Development Division

Mark Gagnon, LTC: B.S., USMA; M.A., University of California – Irvine; Ph.D., Harvard University.

Center for Enhanced Performance

Carl J. Ohlson, LTC: Director; B.S., USMA; M.Ed., University of Virginia; M.M.A.S., Air University; Ph.D., Penn State University.

Scott Smith, LTC: Deputy Director; B.S., USMA; M.B.A., Oklahoma City University; M.S., Ed.S., Florida State University; Ph.D., University of Florida.

Student Athlete Counselors

William R. Irwin: Student Athlete Counselor; B.A., University of Connecticut; M.Ed., Springfield College.

Caltha F. Seymour: Student Athlete Counselor; B.S., University of Delaware.

Academic Excellence Program

Michelle Nadeau-Schaff: Director; B.A., University of Southern Maine; M.S., State University of New York at Cortland.

Kathy Eagan: B.S., State University of New York at New Paltz; M.A., State University of New York Empire State College.

Michelle M. Gerdes: B.A., Colgate University; M.S., Duquesne University; M.S., Long Island University - C.W. Post.

Melisa L. Phillips: B.S., Eastern Kentucky University; M.Ed., Clemson University.

Robert E. Ryan: B.S., USMA; M.S., Long Island University.

Laura J. Vetter: B.S., M.S., Kansas State University.

Military Enhancement Program

Gregory A. Burbelo, LTC: Director; B.S., University of Rhode Island; M.Ed., Springfield College.

William Navarro, MAJ: Instructor; B.S., USMA; M.Ed., Springfield College.

Andy L. Riise, CPT: MEP Instructor; B.S., USMA.

David E. Short, MAJ: Instructor; B.A., Stonehill College; M.A., Webster University.

Performance Enhancement Program

Nathaniel W. Zinsser, Dr.: Program Director; B.A., Hampshire College; M.A., Columbia University; Ph.D., University of Virginia.

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Michael C. Denehy, MAJ: B1

Ronsoni R. Long, SFC: B1

William Richardson, MAJ: C1

Diego A. Sanchez, MSG: C1

Joshua Christy, CPT: D1

Brock A. Ickes, SFC: D1

Christopher Kliewer, CPT: E1

Casey S. Capaz, SFC: E1

George A. Aubert, MAJ: F1

Robert W. Frame, SFC: F1

Cassandra V. Facciponti, CPT: G1

Jeremy R. Hernandez, SFC: G1

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Tom Falzone, Mr.

Felix Serra, SFC.

Sean K. O'Toole, SGT.

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Office of the Director of Intercollegiate Athletics

Boo Corrigan: Director; B.S., University of Notre Dame.

Jonathan Evans: Deputy Director; B.S., Humboldt (California) State University; M.A., Appalachian State University.

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Monica Love: Associate Director, Compliance; B.A., Drake University; J.D., University of Iowa.

Chris Kingston: Special Assistant to the Athletic Director; B.A., University of Central Florida.

Baseball

Joe Sottolano: Head Coach; B.S., M.S., Ithaca College.

Matt Reid: Assistant Coach; B.A., University of Richmond; M.S., Virginia Commonwealth University.

Anthony DeCicco: Assistant Coach; B.S., State University of New York Empire State College; M.S., University of Vermont.

Men's Basketball

Zach Spiker: Head Coach; B.S., Ithaca College; M.S., West Virginia University.

Jim Platt: Assistant Coach; B.S., Concordia University.

Kendrick Saunders: Assistant Coach; B.A., Palm Beach Atlantic College.

Jeff Platt: Assistant Coach; B.S., Tulsa; M.S., Eastern Central University.

Ka'Ron Barnes: Assistant Coach; B.S., Cornell University.

Women's Basketball

Dave Magarity: Head Coach; B.S., Saint Francis College.

Maureen Magarity: Associate Coach; B.A., M.P.A., Marist College.

Shandrika Lee-Gerch: Assistant Coach; B.S., Pepperdine; M.S., Cal Poly.

Erin Mills: Assistant Coach; B.A., M.A., Fairleigh Dickinson University.

Jason Marshall: Assistant Coach; B.A., Ramapo College.

Cross Country, Indoor and Outdoor Track (Men and Women)

Troy Engle: Head Coach; B.S., Amherst College; M.S., University of Massachusetts.

Knute Hjeltnes: Assistant Coach; B.S., M.S.; Brigham Young University.

Greg Lott: Assistant Coach; B.A., Dickinson College.

Joe Rogers: Assistant Coach; B.A., M.A., Miami of Ohio University.

Kristin Kalinowski: Assistant Coach; B.A., Lafayette College.

Jayne Penn: Assistant Coach; B.A., Georgetown University.

Football

Rich Ellerson: Head Coach; B.Ed., M.Ed., University of Hawai'i.

John Brock: Assistant Coach/Director, Player Personnel; B.A., Curry College.

Clarence Holmes, CPT: Assistant Coach, Defensive Tackles; B.S., USMA.

John Mumford: Assistant Coach, Defensive Ends; B.A., Pittsburgh State University.

Payam Saadat: Assistant Coach/ Co-Defensive Coordinator, Linebackers; B.S., Washington State University; M.S., Cal Poly.

Chris Smeland: Assistant Coach/ Co-Defensive Coordinator, Safeties; B.S., Cal Poly; M.B.A., University of Colorado.

Bill Tripp: Assistant Coach, Offensive Tackles; B.S., University of Bridgeport; M.Ed., University of Arizona.

Tony Coaxum: Assistant Coach, Cornerbacks; B.S., USMA.

Andy Guyader: Assistant Coach, Wide Receivers; B.S., Cal Poly; M.S., Ph.D., California Institute of Technology.

Robert Lyles: Assistant Coach, Whips; B.F.A., Texas Christian University.

Gene McKeehan: Assistant Coach, Offensive Guards/Centers; B.S., M.S., Utah State University.

Joe Ross: Assistant Coach, Fullbacks/ Special Teams; B.S., USMA.

Ian Shields: Assistant Coach/Offensive Coordinator, Quarterbacks; B.S., M.A.I.S., Oregon State University.

Tucker Waugh: Assistant Coach, Running Backs; B.A., DePauw University.

Sprint (150 lb.) Football

Mike McElrath, LTC: Head Coach; B.S., USMA; M.B.A., Duke University.

Golf

Brian D. Watts: Head Coach; B.S., Western Oregon University.

Gymnastics

Douglas Van Everen: Head Coach; B.S., California State University at Fullerton; M.S., Ph.D., St. Mary's College of California.

Carmine Giglio: Assistant Coach; B.S., Western Michigan University.

Hockey

Brian Riley: Head Coach; B.A., Brown University; M.Ed., Boston University.

Tom Doran: Director of Hockey Operations; A.S., State University of New York at Rockland.

Rob Haberbusch: Assistant Coach; B.A., Fairfield University; M.Ed., University of Findlay.

Trevor Large: Assistant Coach; B.S., Ferris State.

Lacrosse

Joe Alberici: Head Coach; B.A., M.Ed., Alfred University.

Mac Diange: Assistant Coach; B.S., State University of New York at Cortland; M.S., State University of New York at Albany.

Mike Murphy: Assistant Coach; B.S., University of New Hampshire.

Rifle

Ron Wigger, MAJ: Head Coach; B.B.A., Eastern Kentucky University; M.S., United States Sports Academy.

Swimming and Diving

Mickey Wender: Head Coach; B.S., University of Vermont; M.S., California State University Northridge.

Ron Kontura: Diving Coach; B.A., Ohio University; M.B.A., Illinois State University.

Bret Lundgaard: Assistant Coach; B.A., Washington.

Nadia Staubitz: Assistant Coach; B.S., University of California-Berkley.

Men's Soccer

Russell Payne: Head Coach; B.S., University of Maryland.

Leo Cullen: Assistant Coach; B.A., University of Maryland.

Women's Soccer

Stefanie Golan: Head Coach; B.A., Duke University.

Fred Thompson: Assistant Coach; B.S., George Mason University.

Mario Rincon: Assistant Coach: B.A., Lynn University.

ADMINISTRATION, STAFF & FACULTY

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Michelle DePolo: Head Coach; B.A., Georgian Court University; M.S., Smith College.

Stacy Birk: Assistant Coach; B.A., Illinois State University.

Kate State: Assistant Coach; B.A., Illinois State University; M.A., Eastern Illinois.

Men's Tennis
Jim Poling: Head Coach; B.S., Clemson University; M.S., University of South Alabama.

Women's Tennis
Paul Peck: Head Coach; B.A., M.S., University of Illinois.

Volleyball
Alma Kovaci: Head Coach; B.S., Temple University.

Jeremy Sands: Assistant Coach; B.S., King's College.

Julie Chester: Assistant Coach; B.A., University of Oklahoma.

Wrestling
Chuck Barbee: Head Coach; B.S., Oklahoma State University.

Ryan Wilman: Assistant Coach; B.A., West Virginia University.

Rafael Vega: Assistant Coach; B.A., Edinboro.

Paul Merritt: Assistant Coach; B.S., USMA.

Athletic Training
Tim Kelly: Head Athletic Trainer, B.S., University of Iowa; M.A., University of Nebraska-Omaha.

Strength Training
Scott Swanson: Coach, Assistant Athletic Director; B.A., Wake Forest University.

Director of Academy Advancement
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Director of Communications
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Chaplain, USMA
Thomas M. (Mike) Durham, CH (COL): Chaplain, USMA; B.A., Wake Forest University; M.Div., New Orleans Baptist Theological Seminary; M.S.S., U.S. Army War College.

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Sue-Simone Hennen: Publications Coordinator; B.A., Harpur College, Binghamton State University.

Nicole Starr, CPT: Chief, Information Systems; B.A., University of Maryland University College-Europe.

Maureen Velez: Minority Recruiting Specialist; B.A., Ladycliff College.

Jonathan T. Belmont, MAJ: Admissions Regional Commander (Northeast); B.S., USMA; M.S., Columbia University.

Michael M. Burns, MAJ: Minority Outreach Officer; B.S., USMA; M.B.A., University of Notre Dame.

Matthew Childers, MAJ: Recruited Athlete Admissions Officer and Congressional Liaison; B.S., USMA; M.B.A., Baylor University.

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Brian R. Wire, MAJ: Admissions Liaison (Soldiers, National Guard); B.S., South Carolina State University; M.B.A., Touro University.

BOARD OF VISITORS
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A number of supporting activities add significantly to the variety and quality of life at West Point. Among other noteworthy activities, the academy boasts nationally recognized information services and a museum with the world's largest public collection of military items.

Information Services

In the early 1800s, cadets at West Point were the first American students to have their lessons illustrated on the chalkboard and among the first students to make extensive use of laboratory equipment. Chalk dust still flies, but today the chalkboard is supplemented by video, audio, graphics, photography, and fabrications. Instruction is supplemented by streaming media, equipment loan, and various other products of modern technology in the academy's traditional small class sections.

The Directorate of Plans, Training, Mobilization and Security (DPTMS) Visual Information Division (VID) helps West Point retain its traditional leadership position in supporting instructional technology. VID provides instructors virtually any teaching aid they need to support and enrich classroom instruction. Television broadcasts, web streams, audiovisual presentation support, and photography and graphics support are all within VID Multimedia Branch's area of expertise.

The state-of-the-art TV broadcast studio, in conjunction with a multi-channel closed-circuit TV system, is used to produce and distribute instructional products for commercial networks or educational TV. This network serves every classroom and laboratory, cadet barracks, study rooms, the library, and many other locations on West Point. A V-Brick service is provided to deliver video over IP. VID provides satellite downlinks to the CCTV system and to V-Brick for the foreign languages departments. Portable audiovisual equipment that includes projectors, digital video camcorders, still cameras, podiums, microphones, screens and accessories of all description is also available for cadets, staff, and faculty to use.

Cadets at West Point were some of the first students in the country to have access to interactive computing via time sharing. Today, each cadet has a notebook computer connected through a state-of-the-art wireless local area network, keeping cadets at the forefront of emerging educational technology.

The Network Enterprise Center – West Point (NEC), attached to the 93rd Signal Battalion, provides a wide range of automation, telecommunications, and information assurance services in support of cadet instruction, academy management, and installation operations. All cadets have free access to all of the computing facilities at West Point and the Internet through the wireless network that is operated and maintained by the NEC.

The Museum

The West Point Museum is the oldest federal and U.S. Army museum, having opened to the public in 1854. Its collections, unlike other military museums in the United States, encompass the military history of the Western world to complement the cadets' study of military history and traditions. Loans to instructors and cadets, and rotating exhibits in cadet areas make the museum a reference source for the West Point community. The museum also receives frequent requests for information on its collection from researchers throughout the world.

In its accessible location at Pershing Center, the museum supports cadet academic activities while welcoming hundreds of visitors daily free of charge. The exhibits of the West Point Museum are divided among six separate galleries. In these galleries the visitor can explore the world's military history from the Stone Age to the space age. It is also possible to trace the history of weapons technology, the growth of the U.S. Military Academy, and the role of the U.S. Army in peace and war. Among the museum's historic memorabilia are a pair of pistols owned by General George Washington, a sword and pistols of Napoleon I, German Field Marshal Hermann Goering's Reichsmarschall baton, Sylvanus Thayer's uniform coat and presentation sword; and the cannon which fired the first shot of the American Expeditionary Forces in World War I.

The museum's original collections date to the American Revolution, when British weaponry captured at the Battle of Saratoga was brought to the fortified camp at West Point. Today the museum still maintains some of these original trophies of war. Artifacts exhibited outside the museum proper include a section of the famous Great Chain stretched across the Hudson River to prevent British navigation of the river, which is displayed on Trophy Point along with artillery pieces of American wars from the Revolution onward. From late May through October visitors are also welcome at Fort Putnam, a key Revolutionary War fortification that provides a commanding view of West Point and the Hudson Highlands. Displays within the fort help to explain its strategic importance. The museum's extensive collection of historical art work and artillery is also exhibited throughout various buildings and exterior sites such as Cullum Memorial Hall, Grant Hall, the Cadet Mess Hall, and the Superintendent's quarters, as well as on Trophy Point.

The West Point Association of Graduates

"Serving West Point and The Long Gray Line"

The West Point Association of Graduates (WPAOG) is the official alumni association of the United States Military Academy. It provides a wide range of services and support to individual graduates, West Point classes, and geographically-based West Point Societies around the world. The WPAOG stewards a 50-Year Affiliation program, connecting a cadet class with the class 50 years senior through a robust series of events. The program connects the graduates of yesterday and today to strengthen The Long Gray Line of West Point graduates as it serves our nation.

As a 501c3 nonprofit, tax-exempt corporation, its philanthropic pursuits maintain a margin of excellence for cadets attending the military academy. Contrary to popular belief, West Point is not funded solely by federal tax dollars. While the academy's core academic, military, and physical-development programs receive federal support, many projects and activities that are of great value but outside the core designation receive minimal to zero funding from the government. The fundraising efforts of the WPAOG directly impact the academy's ability to maintain its reputation as one of the nation's top colleges.

The WPAOG is located at West Point in Herbert Alumni Center (698 Mills Road, West Point, NY 10996), where the staff is always available to provide assistance to graduates, cadets, and their families. The building is also home to the WPAOG Gift Shop and the magnificent Great Hall, which is available for official and private functions.

You can contact WPAOG by calling (800) BE-A-GRAD, or you can visit them on the web at www.westpointaog.org.

Visitors Center

The Visitors Center provides an excellent starting point for all visitors to the United States Military Academy. There are exhibits on cadet life, a full-scale cadet barracks room, an information desk, guided tour desk, gift shop, and restrooms. There are static and video displays throughout the center. A theater also has videos showing continuously. The Visitors Center is open daily from 9 a.m. to 4:45 p.m. except for Thanksgiving, Christmas, and New Year's Day.

For Visitors Center information, please call (845) 938-2638/7049. For information on the guided tours of West Point, please go to www.westpointtours.com or call (845) 446-4724.

West Point Parents Clubs

West Point Parents Clubs are unofficial, non-profit organizations run by and for the parents of cadets. There are approximately 80 clubs across the United States and in Europe and Puerto Rico. By working with the U.S. Military Academy Admissions field representatives and West Point Societies, parents clubs support both the academy and cadet parents. To find out about the club in your area, contact the Parents Club Coordinator in the West Point Directorate of Public Affairs by calling (845) 938-5650.

West Point Preparatory School

Many young men and women profit from an additional year of maturing before entering West Point. The U.S. Military Academy Preparatory School (USMAPS) has a 10-month program that prepares selected applicants for entrance to the academy. Each graduate of USMAPS must still compete with other candidates for admission to West Point.

Application procedures depend on a candidate's status – military or civilian – prior to entry. Active Army, Army Reserve and National Guard applicants must follow the steps outlined in Army regulations. Civilian applicants who would like to be considered for USMAPS if not selected for West Point should indicate that on their West Point applications.

USMAPS candidates must meet the same general requirements for admission to West Point. Prep school cadets undergo intensive academic, physical, and military training. The academic program, which includes English and mathematics, is divided into two terms: The first term is a comprehensive review of high school English and mathematics, with emphasis on literature, grammar, algebra, geometry, and trigonometry. The second term is an introduction to college-level composition, literature, solid geometry, spherical trigonometry, and calculus. Electives are available to those who qualify. Rigorous physical training helps condition prep cadets for the athletic program at West Point. USMAPS currently competes in nine varsity sports and four club athletics teams and offers a variety of intramural sports.

"Prepsters" get some formal military training, although many cadets have completed basic military training before entering USMAPS. Prepsters are frequently counseled and evaluated on military, academic, and leadership performance, preparing them for life at West Point.

For further information on the West Point Preparatory School, visit their website at www.westpoint.edu/USMAPS.

Appendix A

I. Oath of Allegiance

I_____
do solemnly swear that I will support the Constitution of the United States, and bear true allegiance to the National Government; that I will maintain and defend the sovereignty of the United States, paramount to any and all allegiance, sovereignty, or fealty I may owe to any State or Country whatsoever; and that I will at all times obey the legal orders of my superior officers, and the Uniform Code of Military Justice.

II. Agreement to Serve

I, having been appointed a cadet of the United States Military Academy, do hereby agree, with the consent of my parents or guardian if I am a minor:

a. To complete the course of instruction at the United States Military Academy;

b. If tendered an appointment as a commissioned officer in one of the armed services upon graduation from the United States Military Academy, to accept such appointment and to serve under such appointment on active duty for at least five consecutive years immediately after such appointment; if my initial appointment hereunder is in a Reserve Component, to accept a commission in a Regular Component if subsequently tendered during the five consecutive years immediately after my initial appointment, and to serve on active duty for the remainder of such period under such appointment.

c. If I am permitted to resign my commission in a Regular Component of one of the Armed Services prior to the eighth anniversary of my graduation, to accept an appointment as a commissioned officer in the Select Reserve (SELRES) of one of the Armed Services and remain therein until such eighth anniversary.

d. To serve a total of eight (8) years from graduation from the United States Military Academy. Any part of that service not completed on active duty must be served in the SELRES (not on active duty), unless I am discharged from the SELRES by proper military authority.

e. That if I fail to complete the course of instruction of the United States Military Academy, breach my service agreement as defined in paragraph 1.g.(3), Statement of Policies on the next page, or decline to accept an appointment as a commissioned officer, I will serve on active duty as specified in paragraphs 1.b. through 1.g., which are contained in the Statement of Policies on the next page;

f. That if I, as a result of misconduct, a volitional act or omission, fail to complete the period of active duty specified in paragraphs IIb, c, d or e above, I may be required to reimburse the United States in an amount that bears the same ratio to the total cost of advanced education provided me as the unserved portion of active duty bears to the total period of active duty I have agreed to serve;

g. Further, that if I am separated from the United States Military Academy for breach of this service agreement, as defined in paragraph 1.g. (3), Statement of Policies on the next page, and the Army decides that I should not be ordered to active duty because such service would not be in the best interests of the Army, I shall be considered to have either voluntarily or because of misconduct failed to complete the period of active duty and may be required to reimburse the United States as described above;

h. For the purpose of this paragraph:

(1) The term "volitional act or omission" refers to an inability to meet any of the standards prescribed in Chapter 6 of Army Regulation (AR) 210-26, *United States Military Academy*, to include, but not limited to, conscientious objection, resignation from the United States Military Academy or United States Army, marriage or support obligation while a cadet, failure to meet weight control program standards, and failure to meet Army Physical Fitness Test standards.

(2) The term "misconduct" includes, but is not limited to, termination of my service by the United States Army because of criminal conduct, conduct violating the Cadet Honor Code, conduct deficiency under the Cadet Disciplinary System, conduct violating the provisions of AR 210-26, and conduct violating regulations for the discipline of the Corps of Cadets.

(3) The term "course of instruction" is synonymous with the term "educational requirements" as the term is used in 10 USC 2005.

III. Marital Status

I am unmarried, do not presently have custody of a child, do not have a legal obligation of support from a prior marriage, and have no legal obligation to support a child or a former spouse. Furthermore, I understand that a cadet who marries, has custody of a child, incurs a legal obligation of support from a prior marriage, or incurs a legal obligation to support a child or former spouse while a United States Military Academy cadet will be separated from the United States Military Academy. Divorce, annulment, or other dissolution of a cadet's marriage does not affect or preclude separation under this provision.

My signature constitutes the taking of the Oath of Allegiance, execution of the agreement to serve, my affirmation as to my marital status, the absence of child custody or a court-ordered child support obligation and my acknowledgment that I have read, understand, and agree to abide by the statement of policies on the next page. For all male cadets, signing this form also constitutes registration with the Selective Service System in accordance with the Military Selective Service Act. Incident thereto the Department of Defense may transmit my name, permanent address, Social Security Number, and birth date to the Selective Service System for recording as evidence of the registration.

_____
(Sign your full name as it appears in Paragraph I above)

Sworn to and subscribed before me at West Point, New York, this 2nd day of July, two thousand and twelve.

*The oath (i.e., USMA Form 5-50) is currently under review at Headquarters, Department of the Army. The oath new cadets will sign on Reception Day may vary slightly from this draft.

USMA Form 5-50 (Previous editions are obsolete).

Statement of Policies

1. Department of Defense Directive 1332.23, dated 19 February 1988, as implemented by Army regulations, provides the following direction concerning separation of cadets prior to the completion of the course of instruction or subsequent to graduation on refusal to accept an appointment as a commissioned officer.

a. A cadet who enters the United States Military Academy (USMA) directly from civilian status assumes a military service obligation of eight years (10 USC 651).

b. A cadet who is separated from West Point because of demonstrated unsuitability, unfitness, or physical disqualification for military service will be discharged in accordance with the applicable Army regulations. Where such a discharge is caused by voluntary action or misconduct on the part of a cadet subject to an active duty obligation, the reimbursement provision of paragraph IIf of the Agreement to Serve will apply.

c. A cadet who enters West Point directly from a civilian status and resigns or is separated from West Point prior to the commencement of the second class academic year will be discharged from the U.S. Army. A resignation tendered by a fourth or third class cadet will be accepted when found to be in the best interest of the service. A cadet who tenders a resignation will be required to state a specific reason for the action.

d. A cadet who enters the military academy from the Regular or SELRES of any military service and who resigns or is separated from West Point prior to the commencement of the second class academic year will revert to his or her former status for the completion of any prior service obligation, except as noted in this subparagraph. This includes cadets who entered West Point from the United States Military Academy Preparatory School as Invitational Reservists, thereby incurring an eight-year reserve military service obligation. Such a cadet who has no remaining prior service obligation will be discharged. Such a cadet who entered West Point from the Regular Army or any SELRES of the Army and who has at the time of separation a remaining prior service obligation of less than one year, may, upon the approval of the Secretary of the Army or his designee, be discharged with waiver of any prior service obligation. All service as a cadet is counted in computing the unexpired portion of the enlistment or period of obligated service.

e. A cadet who has commenced his or her second class academic year and who resigns or is separated prior to completing the course of instruction, except for physical disqualification, unfitness, or unsuitability, will normally be transferred to the SELRES in an enlisted status and, if deemed to have breached his or her service agreement, may be ordered to active duty for not less than two years (10 USC 4348(b)) but no more than four years. The Secretary of the Army or his/her designee will retain final authority to order the individuals to active duty. Completion or partial completion of service obligation acquired by prior enlistment in no way exempts a separated cadet from being transferred to the SELRES and ordered to active duty under these provisions.

f. Any first class cadet who completes the course of instruction and declines to accept an appointment as a commissioned officer will be transferred to the SELRES in an enlisted status and ordered to active duty for four (4) years (10 USC 4348(b)).

g. The foregoing provisions will be applied in accordance with the following guidance:

(1) The second class academic year shall be deemed to have commenced at noon on the first day of regularly scheduled academic classes following the summer training period. As an exception, the second class year for a cadet who is designated a potential mid-year graduate will commence at noon on the first day of regularly scheduled classes in the term following the advancement of that cadet into the second class.

(2) In cases where it is necessary to determine whether a cadet resigned prior to or following the commencement of the second class year, the critical date is the date the resignation action is initiated by the cadet.

(3) In cases in which the academy discovers an incident giving rise to separation in one academic year, but separation is not initiated (or a resignation in lieu of the same is not forwarded by the chain of command) until the following year, the separation action will be deemed to have "started" on the date of discovery for purposes of computing the service obligation and pay grade under AR 612-205, table 3.

(4) "Breach of service agreement" includes separation resulting from resignation, from any of the bases for separation listed in **Table 7-1**, Regulations for the United States Military Academy, including all additions to **Table 7-1** subsequent to the date of this agreement, or from other willful acts or omissions (paragraph 7-9, Regs USMA).

2. Normally, all graduates of West Point will be appointed by the president as commissioned second lieutenants on active duty in the United States Army. However, cadets may state a preference for appointment, upon graduation, as a commissioned officer in either the U.S. Navy, U.S. Air Force, or U.S. Marine Corps (10 U.S.C. 541 (a)). Such appointment will be contingent upon the approval of both the Secretary of the Army and the service secretary of the gaining military department.

3. Any first class cadet, including potential mid-year graduates, in either of the two terms prior to their anticipated graduation, who resigns or is separated, if fully qualified, may be recommended by the Superintendent and approved by the Secretary of the Army, and may be commissioned in the SELRES. Such action may be appropriate in cases of administrative resignations, including cases of separation for marriage, or child support or similar circumstances. The effective date of rank in the Reserve component will be no earlier than the graduation date of the individual's class.

(1) Be commissioned in the SELRES for service as a Select Reservist. There will be an eight-year military service obligation associated with this appointment; or

(2) After receipt of a baccalaureate degree, be commissioned in the SELRES and compete with Reserve Officer Training Corps graduates for active duty or active duty for training. The military service obligation for those selected for active duty under this provision will be eight years, three of which will be on active duty.

No such appointment in a commissioned grade in the SELRES will be prior to the date of graduation of the class of which the individual concerned was a member at the time of resignation or separation from West Point.

Please note: The oath new cadets sign on Reception Day may vary slightly.

Appendix B

Medical Standards and Disqualifications

DODI 6130.4 and DoDMERB requirements for a military appointment include medical standards of fitness. These requirements are contained in the Department of Defense Instruction 6130.03 (April 2010), "Medical Standards for Appointment, Enlistment, or Induction in the Military Services," and are used by the Department of Defense Medical Examination Review Board (DoDMERB). You can access that document here: http://www.dtic.mil/whs/directives/corres/pdf/613003p.pdf. DoDMERB determines the medical fitness of all applicants to the five United States service academies and for ROTC scholarship programs. The review by DoDMERB ensures that a candidate does not have a physical or mental condition that would preclude or be aggravated by his or her participation in the academic and military duties encountered during the training at West Point or would be an impediment to field duty after graduation.

After submitting your application to West Point, you will receive a letter with instructions on scheduling your medical exam. If you are in the continental United States (CONUS), you will receive the letter from their contractor, Concorde. If you are overseas, you will receive it from DoDMERB. Do not delay. Schedule your medical exam immediately upon receipt of your scheduling information.

Medical Examination

Every candidate must take a medical examination given at authorized examining centers throughout the United States and at certain overseas bases. Examinations by private physicians and optometrists cannot be considered authorized medical examinations. Only examinations given at DoDMERB-authorized medical facilities are accepted examinations.

Each applicant's medical history is reviewed for information on illnesses, injuries, surgical procedures, congenital or familial diseases or other factors that could affect current or future medical status. Applicants may be asked to provide additional reports and/or records from a physician or hospital.

Medical conditions that are hidden or not reported for whatever reason can result in the candidate being denied entrance to West Point on Reception Day (R-Day).

Medical Requirements

The following are some common medical disqualifications. THIS LIST IS NOT ALL-INCLUSIVE. Any condition that in the opinion of the medical officer shall significantly interfere with the successful performance of military duty or training may be disqualifying. Should you have any questions regarding causes for disqualification, this information may be obtained by writing to the Department of Defense Medical Examination Review Board, 8034 Edgerton Drive, Suite 132, USAF Academy, Colorado Springs, Colorado, 80840-2200, or by calling (719) 333-3562. Visit the website: https://dodmerb.tricare.osd.mil for additional information.

Eye and Vision

Vision: Distant visual acuity not correctable to 20/20 in one eye and 20/40 in the other eye is disqualifying.

Muscle Balance: Esotropia over 15 prism diopters, exotropia over 10 prism diopters, or hypertropia over 5 prism diopters is disqualifying.

Color Vision: Inability to distinguish vivid red and vivid green is disqualifying.

Refractive Surgery: Procedures to change the refraction (refractive surgery) including but not limited to: Lamellar and/or Penetrating Keratoplasty, Radial Keratotomy and Astigmatic Keratotomy are disqualifying. Refractive surgery performed with an Excimer Laser, including but not limited to Photorefractive Keratectomy (PRK), Laser Epithelial Keratomileusis (LASEK), and Laser-Assisted in situ Keratomileusis (LASIK) is disqualifying if any of the following conditions are met: The pre-operative refractive error exceeded +8.00 or -8.00 diopters (spherical equivalent) in either eye; pre-operative astigmatism exceeded 3.00 diopters; at least a six-month recovery period has not occurred between last refractive surgery or augmenting procedure and DoDMERB medical exam; there have been complications and/or medications or ophthalmic solutions required; and post-surgical refraction in each eye is not stable.

Refractive Error: Myopia over -8.00 diopters in spherical equivalent, or hyperopia over +8.00 diopters equivalent is disqualifying. Astigmatism over 3 diopters is disqualifying.

Rigid Contact Lenses: Must be removed 21 days prior to the eye examination. This requirement also includes gas-permeable lenses. For those applicants undergoing Ortho-Keratology or Corneal Refractive Treatment, rigid lenses need to be removed for 90 days prior to the eye examination.

Soft Contact Lenses: Must be removed 3 days prior to the eye examination.

Candidates who wear eyeglasses or contact lenses must have their eyeglasses or contact lenses with them at the time of their medical examinations.

Head, Scalp, Face, and Neck

Abnormalities that interfere with wearing military equipment or are disfiguring are disqualifying.

Nose and Sinuses

Malformations or deformities that interfere with speech or breathing, chronic rhinitis inadequately controlled, or an allergy desensitization program within one year of accession are disqualifying.

Ears and Hearing

Moderate hearing loss in the 500 to 4000 Hz frequencies, a history of middle ear surgery, abnormalities of the external ear, the use of hearing aids, a perforated eardrum (to include a retained tympanostomy tube) or a perforated eardrum surgically repaired within 120 days of the DoDMERB physical exam will result in medical disqualification.

Lungs, Asthma, and Chest

A history of pneumothorax within the past year, if due to simple trauma or surgery, or a history within the past three years if spontaneous; asthma, including reactive airway disease; exercise-induced bronchospasm or asthmatic bronchitis, reliably diagnosed after the 13th birthday are disqualifying. A positive tuberculosis skin test is disqualifying, if not treated. Individuals who have a negative Quantiferon Gold test are not disqualified. Individuals taking prophylactic chemotherapy because of recent skin test conversion are not disqualified.

Skin

Disqualifications: A verified history of psoriasis; eczema or atopic dermatitis after the 9th birthday; pilonidal cyst with mass or discharging sinus. Treatment with Accutane is temporarily disqualifying until eight weeks post-therapy.

Heart and Vascular System

Disqualifications: History of hypertension, valvular, septal, congenital or other defects. Supraventricular tachycardia is disqualifying unless there is no recurrence during the preceding two years while off medication or post ablation.

Endocrine and Metabolism

Disqualifications: A history of thyroidectomy; current goiter; history of hyperthyroidism; thyroiditis, hyperparathyroidism, hypoparathyroidism, or diabetes mellitus. Hypothyroidism, if uncontrolled by medication, is disqualifying.

Spine and Other Musculoskeletal

Disqualifications: Scoliosis, kyphosis, or lordosis likely to impair normal function; herniated disc or history of operation for this condition; history of chronic or recurrent low back pain; fusion of the spine; spondylolysis or spondylolisthesis; symptomatic pes planus, or residual deformity from clubfoot or pes cavus; surgical repair of anterior or posterior cruciate ligament injuries of the knee must be evaluated at least six months after surgery for stability and symptoms. A history of all fractures, severe sprains, and any type of orthopedic or podiatric surgery (including arthroscopic surgery) must be documented in application medical examination.

Genitourinary System

Disqualifications: Horseshoe kidney or absence of one kidney; kidney stones; proteinuria, hematuria, or pyuria that is persistent or indicative of chronic renal disease; hydronephrosis; atrophy or absence of one or both testicles; undescended testicle. Hydrocele/varicocele will be evaluated. Congenital absence of the uterus. Irregularities of the menstrual cycle, including heavy menses, bleeding between menses, or lack of menses will be reviewed and evaluated. Severe dysmenorrhea, endometriosis, pregnancy are disqualifying.

Abdomen and Gastrointestinal System

Disqualifications: History of ulcer; gastro-esophageal reflux disease; regional enteritis (Crohn's), ulcerative colitis or other inflammatory bowel disease; gallbladder disease; chronic hepatitis, including hepatitis B or C carriers. Current hernia or history of surgery for hernia within preceding six months is temporarily disqualifying.

Nervous System

Disqualifications: Diagnosed seizure disorder since the age of 5; anticonvulsant medications within five years of the examination; history of unexplained unconsciousness; documented history of headaches within the past three years that interfere with daily functions or require medical treatment. History of head injury resulting in unconsciousness will be evaluated and may require a complete neurological evaluation to include electroencephalogram.

Psychiatric

History of academic skills or perceptual defects that interfere with work or school may be qualified if successful school and work performance can be demonstrated without utilization or recommendation of accommodations within the previous 12 months. Use of stimulant medication in the previous 12 months to improve or maintain academic skills (e.g. Ritalin, Adderall) is disqualifying. History of attempted suicide or other suicide behavior; psychoneurosis; personality disorders; other disorders of emotion, behavior, thought, mood; or substance misuse will be evaluated and may be cause for disqualification. Stuttering, eating disorders, and sleepwalking are disqualifying.

Dental

Active orthodontic appliances are disqualifying. Retainer appliances are permissible, provided all orthodontic treatment has been satisfactorily completed.

Perforation(s) of the hard palate; cleft lip, unless satisfactorily repaired by surgery, are disqualifying.

After the Exam

After the initial exam, your file will be reviewed at DoDMERB. They will find you either "Qualified" or "Disqualified" or place you in "Remedial" status. You can check your medical status on the DoDMERB web site at https://dodmerb.tricare.osd.mil.

If you are Remedial status, DoDMERB will request additional tests, exams, or information to answer any questions they have. You should comply with any requests immediately. After receiving your additional information, DoDMERB will continue to review your file.

If you are disqualified, the academy will consider you for a waiver if you are competitive for an offer of admission to West Point. Do not send waiver requests to the academy. West Point will notify you of the waiver decision in writing as soon as the review process is complete.

In most cases, your entire file will be reviewed by DoDMERB before any disqualifications are formally applied and forwarded to West Point. DoDMERB no longer ceases the review process at the first disqualification to consult with West Point. It behooves you to immediately comply with any remedial requests from DoDMERB, since your disqualification(s) will not be forwarded for consideration for a waiver by the academy until all remedials are received by DoDMERB. If you are having difficulty obtaining medical records, inform DOMERB of the situation. Other methods of obtaining information may be used.

Waivers

Some medical standards can be waived for applicants who are otherwise highly qualified. Once a medical disqualification status is applied by DoDMERB, the senior medical officer at West Point will have access to your same medical records originally sent to DoDMERB. The senior physician at West Point, after consultation with the Directorate of Admissions, may request additional information, such as a medical consult or study. This will come to you as a letter "At the request of the U.S. Military Academy … additional information is required," which will be sent to you from DoDMERB. When you are being considered for a waiver, you are dealing with West Point, using DoDMERB as the intermediary for information. Please return all requested information/documentation to DoDMERB in Colorado Springs, CO. DoDMERB will ensure all waiver-requested information is posted to the senior physician at West Point with every piece of information DoDMERB receives. DoDMERB does NOT apply any waivers, but will assist you with questions during the process of obtaining and completing the requested medical information. Questions regarding the status of your medical waiver should be directed to the Admissions Office at West Point. The academy will notify you of the waiver decision in writing as soon as the review process is complete.

Injury or Hospitalizations

If you are injured or hospitalized after your initial exam, or if you failed to report any medical conditions during your exam, you should contact DoDMERB immediately. Failure to disclose medical, dental, visual, or psychological conditions can be grounds for separation from West Point.

Appendix C

Candidate Fitness Assessment

Satisfactory completion of the Candidate Fitness Assessment (CFA) is one of the requirements for admission to the United States Military Academy. The CFA is a test of strength, agility, speed and endurance. It is used to predict a candidate's aptitude for the physical program at the service academies.

The results of this test are very important in the overall assessment of your admissions file, so you should become familiar with the six events in the CFA and practice them. The examination consists of the following events: basketball throw (from kneeling position), cadence pull-ups or the flexed-arm hang (women's option), a shuttle run, modified sit-ups (crunches), push-ups, and a 1-mile run.

In order to qualify for admission, you must take the CFA. Your score is a combination of your best efforts on each of the six events. You should strive for excellence and the highest possible score.

The six test events of the CFA are administered consecutively with specified start, finish, and rest times. Candidates should attempt to do their best on all six events, keeping in mind that the events are sequenced to produce a cumulative loading effect. In other words, after completing the first five events, it is doubtful a candidate will score his/her personal best on the 1-mile run. This has been considered in the development of the scoring standards, which will be used to evaluate performance in each of the six events.

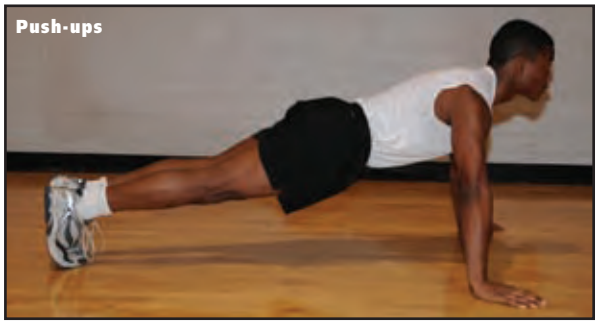
Appendix D

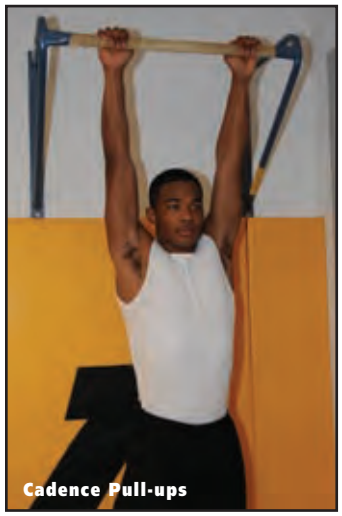
Privacy Act Statement

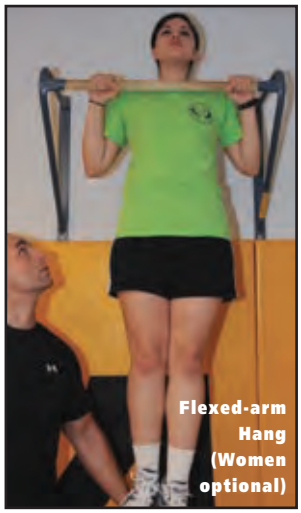
Required candidate information is requested pursuant to 10 U.S.C. Section 4346, Cadets: requirements for admission. Providing the requested information, including Social Security Number, is voluntary, but without this information, the U.S. Military Academy may not be able to send a reply.

This information will be used in providing you a Candidate Questionnaire and additional candidate information forms, and to open a database candidate file for you; your Social Security Number is needed as a means of accessing and tracking your database entry.

Generally, government records are releasable to persons within the Department of Defense who have a need to know. Information you provide may be disclosed to members of Congress to assist them in nominating candidates, and to Admissions field representatives who handle candidate interviews and provide application assistance.







CANDIDATE FITNESS ASSESSMENT				
Events	**Test Start Time**	**Testing Time**	**Rest**	**Total Time**
Basketball Throw	0 Minutes	2 Minutes	3 Minutes	5 Minutes
Cadence Pull-ups	5 Minutes	2 Minutes	3 Minutes	10 Minutes
Shuttle Run	10 Minutes	2 Minutes	3 Minutes	15 Minutes
Modified Sit-ups	15 Minutes	2 Minutes	3 Minutes	20 Minutes
Push-ups	20 Minutes	2 Minutes	8 Minutes	30 Minutes
1-Mile Run	30 Minutes	Until Completed		Until Completed

TABLE 1. Maximum performance scores by event and gender.

	BB Throw (ft)	Pull-ups	Shuttle Run (sec.)	Modified Sit-ups	Push-ups	1-Mile Run
Male	102	18	7.8	95	75	5:20
Female	66	7	8.6	95	50	6:00

TABLE 2. Average performance scores by event and gender.

	BB Throw (ft)	Pull-ups	Shuttle Run (sec.)	Modified Sit-ups	Push-ups	1-Mile Run
Male	67	9	9.1	72	54	6:43
Female	41	3	10	68	33	8:06

Appendix E

Restrictions on Personal Conduct in the Armed Forces

1. Military life is fundamentally different from civilian life. The military has its own laws, rules, customs, and traditions, including numerous restrictions on personal behavior. These are necessary because military units and personnel must maintain the high standards of morality, good order and discipline, and unit cohesion that are essential for combat effectiveness.

2. The Armed Forces must be ready at all times for worldwide deployment. Military law and regulations, including the Uniform Code of Military Justice, apply to service members at all times, both on base or off base, from the time the member enters the service until the member is discharged or otherwise separated from the Armed Forces.

3. Members of the Armed Forces may be involuntarily separated before their term of service ends for various reasons established by law and military regulations, such as:

(a) A member may be separated for a pattern of disciplinary infractions, a pattern of misconduct, commission of a serious offense, or civilian conviction.

(b) A member who has been referred to a rehabilitation program for personal drug and alcohol abuse may be separated for failure through inability or refusal to participate in, cooperate in, or successfully complete such a program.

(c) A member may be discharged by reason of parenthood, if it is determined the member, because of parental responsibilities, is unable to perform his or her duties satisfactorily or is unavailable for worldwide assignment or deployment.

(d) A member may be separated for failure to meet service weight control standards.

(e) A member may be separated for harassment or violence against any service member.

Calendar

2011

15	August	First Term Begins
5	September	Labor Day (classes suspended)
10	October	Columbus Day (classes suspended)
11	November	Veterans Day (classes suspended)
24-27	November	Thanksgiving Leave (begins after last duty/class)
10	December	Army/Navy Football Game (BEAT NAVY!)
17	December	Winter Break Begins

2012

3	January	Winter Break Ends
9	January	First Day of Classes
16	January	Martin Luther King Day (classes suspended)
17-20	February	Presidents Weekend (classes suspended)
9-11	March	Plebe Parent Weekend
10-18	March	Spring Leave (begins after last duty/class)
26	May	Graduation '12
27	June	Reception Day, Class of 2016

West Point: The Challenge and The Future

The United States Military Academy at West Point founded in 1802 and steeped in a tradition that has developed many of our nation's finest leaders, offers you an opportunity for educational enrichment, leadership development, and career potential in the service of our country.

"'Duty, Honor, Country.' Those three hallowed words reverently dictate what you ought to be, what you can be, what you will be ..."

This historic quotation by General Douglas MacArthur provides a cornerstone of what West Point stands for in the eyes of many. It is a special place. It may be a special place for you.

West Point will challenge you, test you, and force you to make personal sacrifices. However, those sacrifices will breed personal triumphs, both today and tomorrow.

The academic program develops the "whole person," providing a foundation for success in today's world of high technology. It is stimulating, developing minds that are creative, critical, and resourceful.

The physical education and athletic programs build strength, endurance, and confidence. The military training within the Corps of Cadets develops discipline, integrity, and loyalty, attributes so essential in developing successful officers.

This catalog provides a concise glimpse of the West Point Experience, and what the academy offers applicants who are interested in a high-quality education and a career as an officer in the U.S. Army.

West Point provides you that opportunity. The choice is yours, and so is the challenge.

For additional information on West Point, please visit our website at www.Admissions.WestPoint.edu.

Telephone (845) 938-4041.

Leadership - Duty - Honor - Country
Service to the Nation - Leadership
Critical Thinking - U.S. Army - Duty
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