WEST POINT

UNITED STATES MILITARY ACADEMY

West Point Calendar

1972 3 July, Monday — Class of 1976 Enters
27 August, Sunday — Reorganization Week Begins
2 September, Saturday — Reorganization Week Ends
4 September, Monday — Labor Day, Holiday
5 September, Tuesday — First Term Begins
23 October, Monday — Veteran's Day (Classes Suspended)
28 October, Saturday — Homecoming (Classes Suspended)
23 November, Thursday — Thanksgiving, Holiday
2 December, Saturday — Army-Navy Football Game
22 December, Friday — Christmas Leave Begins (Noon)

1973 7 January, Sunday — Christmas Leave Ends
12 January, Friday — Term End Examinations Begin
20 January, Saturday — First Term Ends (Noon)
22 January, Monday — Second Term Begins
19 February, Monday — Washington's Birthday, Holiday
24 March, Saturday — Spring Leave Begins (12:00 Noon)
1 April, Sunday — Spring Leave Ends (6:00 PM)
19 May, Saturday — Armed Forces Day
21 May, Monday — Term-End Examinations Begin
26 May, Saturday — 2d Term Ends for 1st Class (Noon)
28 May, Monday — Memorial Day, Holiday
30 May, Wednesday — June Week Begins
31 May, Thursday — 2d Term Ends for Under Classes
6 June, Wednesday — Graduation Day, Class of 1973
2 July, Monday — Class of 1977 Enters

Admissions Calendar/Critical Dates

March 1972 - January 1973 — Request nomination from authorized sources; write Admissions, USMA, for file initiation
1 June 1972 — Candidates may begin taking Medical Exams which will be valid for entrance in July 1973
July 1972 - January 1973 — Receive nomination
14 October 1972 — CEEB, SAT, Texas and California only
21 October 1972 — American College Testing (ACT) Program Exams
4 November 1972 — College Entrance Examination Board Testing (SAT only)
2 December 1972 — College Entrance Examination Board Testing
9 December 1972 — American College Testing Program Exams
13 January 1973 — College Entrance Examination Board Testing
24 February 1973 — American College Testing Program Exams
3 March 1973 — College Entrance Examination Board Testing (Make-Up)
*April 1973 — Candidate Appointment (Offer of Admission to Selected Candidates)
2 July 1973 — New Fourth Class Enters (Class of 1977)

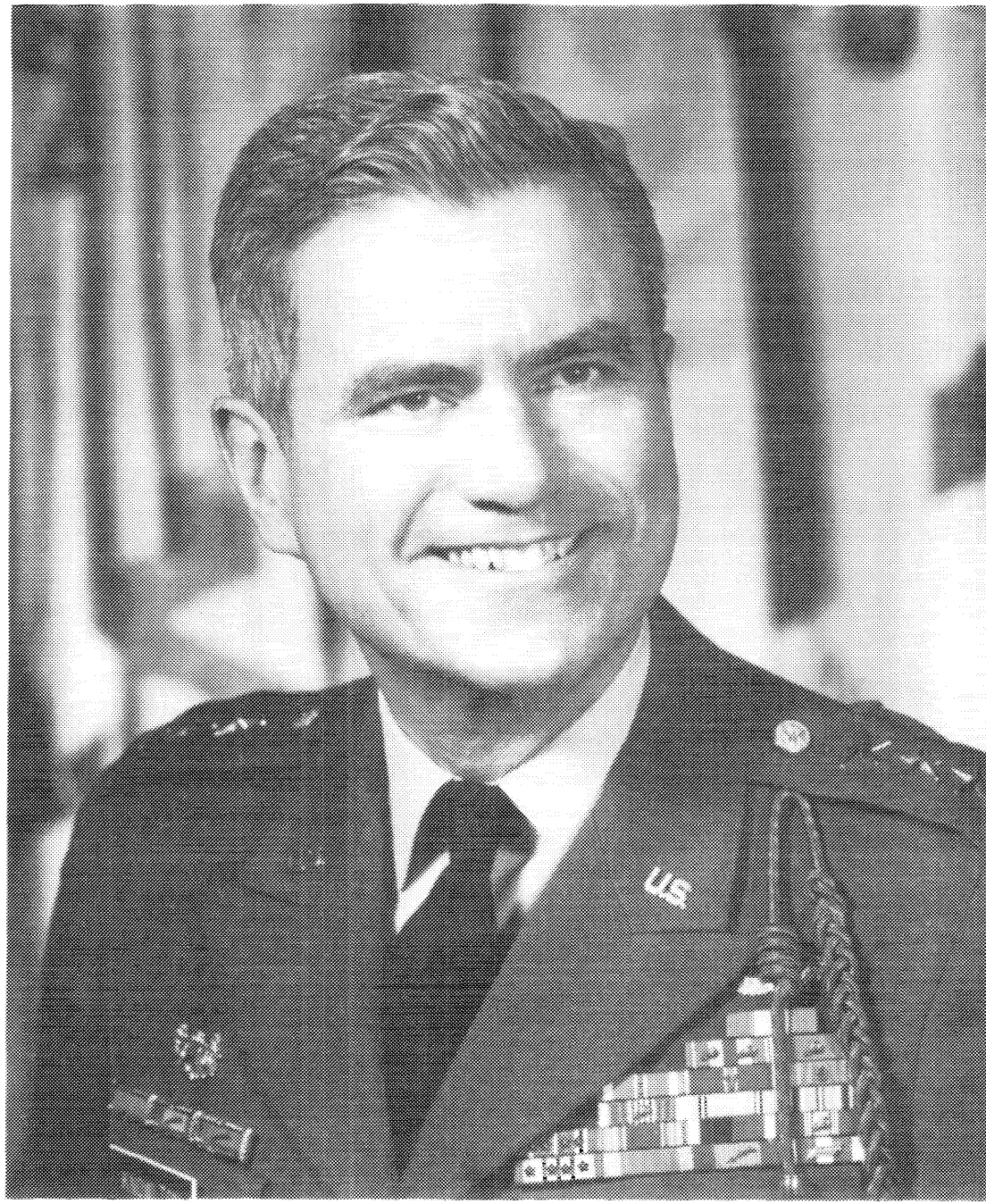
* Early offers of admission are given to outstanding candidates beginning 15 October; waiting-list selections are made during May and June.

WEST POINT

United States Military Academy

1972-1973 Yearbook

One Hundred Seventy-First Year


US

Gentlemen:

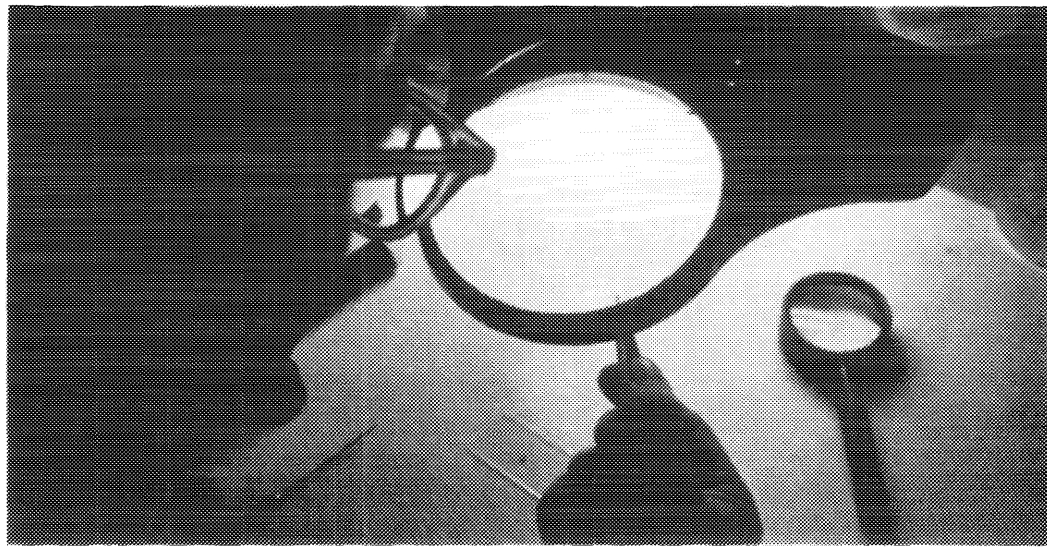
For most of you, the time is near when you must make a decision which could be one of the most important of your life: where and how you will obtain your college education. That decision is of such importance that it must be made with careful consideration.

If you are a man of potential, ability and adventurous spirit, West Point is an institution you should consider. The United States Military Academy provides a superior education. We are modern in concept and staff. During this decade we have made great advancements in our academic program, providing a more flexible curriculum and a growing diversity of electives. We offer some of the finest and most advanced educational and physical development facilities in the world. Additionally, we continue to amass a tradition and sentiment among our graduates that can be found at no civilian institution of higher learning in the country. A West Point education not only prepares a young man for a career of service to his country but also prepares him well for later graduate schooling. It offers him challenges, excitement, diversity, and a prominent role in the nation's expanding future. In recent years, for example, six West Point graduates have pioneered the United States space exploration program. Future West Pointers will probe new horizons which will offer other great challenges and adventure—mental and physical—in service to country and mankind.

There are many educational and career opportunities open to young men today but most of these have increasing similarities. This is not the case with West Point. As you read this catalog, I ask you to contemplate the many advantages that only West Point can offer.

William A. Knowlton

WILLIAM A. KNOWLTON
Lieutenant General, USA
Superintendent



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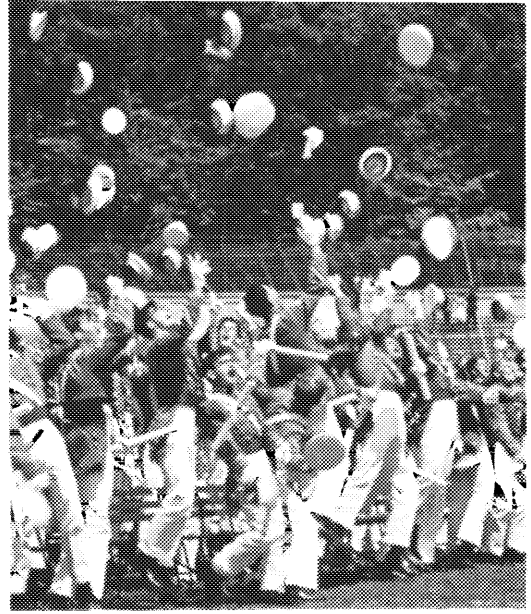
Mission of the Military Academy



The mission of the United States Military Academy is to instruct and train the Corps of Cadets so that each graduate will have the qualities and attributes essential to his progressive and continued development throughout his career as an officer of the Regular Army.

Inherent in this mission are the following objectives:

Mental — To provide a broad collegiate education in the arts and sciences upon which a Regular Army officer can base that continued intellectual development essential to a military career. This education leads to the Bachelor of Science degree.

Moral — To develop in the cadet a high sense of duty and the attributes of character with emphasis on integrity, discipline, and motivation essential to the profession of arms.

Physical — To develop in the cadet those physical attributes essential to a career as an officer of the Regular Army.

Military — To provide a broad military education rather than individual proficiency in the technical duties of junior officers. Such proficiency is, of necessity, a gradual development, the responsibility for which devolves upon the graduates themselves and upon the commands and schools to which they are assigned after being commissioned.

Graduation and Conferring of Degree

Each graduate of the United States Military Academy is awarded the Bachelor of Science.

Commissioning of Graduates

Graduated cadets are commissioned as second lieutenants in the Regular Army and are required to serve a minimum of five years in the United States Army immediately following the date of graduation.

Graduated cadets are allowed full pay as second lieutenants from the date of graduation upon appointment in the Regular Army.

Administration

The United States Military Academy is under the general direction and supervision of the Department of the Army. The Secretary of the Army has designated the Chief of Staff of the Army as the officer in direct charge of all matters pertaining to West Point.

The immediate government and military command of the Academy and the military post at West Point are vested in the Superintendent. The Dean of the Academic Board coordinates the activities of the academic departments and advises the Superintendent on academic matters. The administration and military training of the Corps of Cadets are under the responsibilities of the Commandant of Cadets, who is also head of the Department of Tactics.

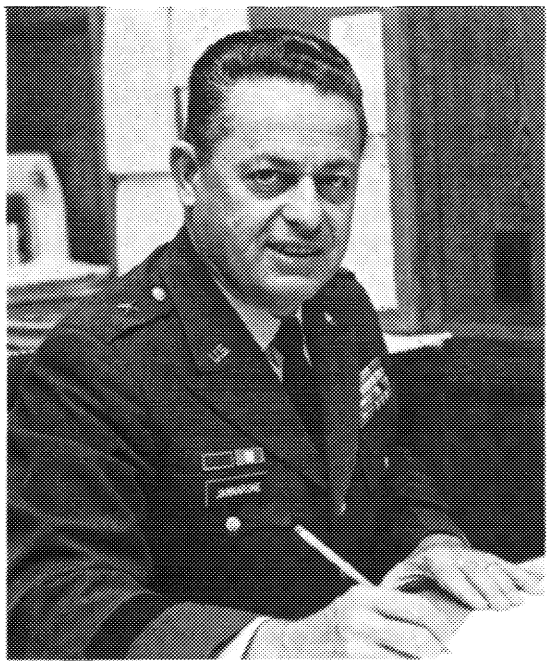
Lieutenant General William A. Knowlton, USA
SUPERINTENDENT

Brigadier General John R. Jannarone, USA
DEAN OF THE ACADEMIC BOARD

Brigadier General Philip R. Feir, USA
COMMANDANT OF CADETS

Colonel George S. Webb, USA
CHIEF OF STAFF

Colonel Manley E. Rogers, USA
DIRECTOR OF ADMISSIONS AND REGISTRAR



A Brief History of the United States Military Academy

The United States Military Academy, oldest of the service academies, has provided military leaders for the U.S. Army since its founding on March 16, 1802.

During the early years of our nation's independence, the establishment of a Military Academy had long been considered essential by many of the nation's leaders. Colonel Henry Knox first proposed such an institution in 1776 and was later supported by Thomas Pickering, Alexander Hamilton, and John Adams. George Washington, in one of his last public acts, urged that "The establishment of an institution of this kind, upon a respectable and extensive basis, has ever been considered by me as an object of primary importance to this country." Because of these strongly held views combined with the volatile international political climate of the late eighteenth century, Congress determined that an Academy devoted to the arts and sciences of warfare would be in the nation's best interests. Thus, on 16 March 1802, Congress authorized a Corps of Engineers to be stationed at West Point, New York (a 1,795 acre garrison site which had been occupied by the Army since 1778) and to constitute a Military Academy. On 4 July 1802, the Academy officially opened with a total complement of fifteen (ten cadets and five officers), with Major Jonathan Williams, grandnephew of Benjamin Franklin, as the first superintendent.

The early mission of the academy was to train military technicians for all branches of the military service, to encourage the study of military art nationally and thus raise the level of training of the militia, and to encourage the practical study of every science. Henry Adams, the most authoritative historian on that period of American life, wrote in his *History of the United States* that American scientific engineering "owed its efficiency and almost its existence to the military school at West Point."

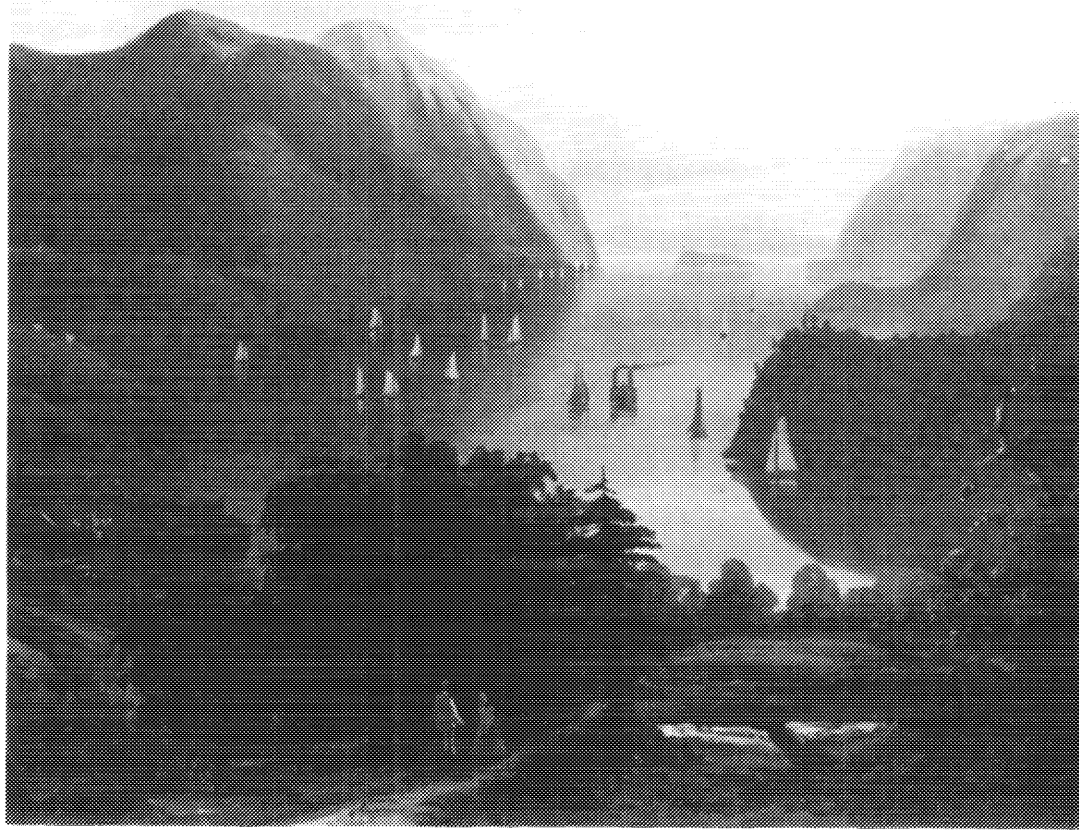
On 29 April 1812, with the threat of war with England, Congress passed an Act which increased the strength of the Corps of Cadets to 250, enlarged the academic staff, established a set of published regulations to govern the daily lives of cadets, and required that each cadet be taught "all the duties of a private, a

Bvt. Brig. Gen. Sylvanus Thayer, Father of the Military Academy West Point Museum Collection

non-commissioned officer, and an officer." Graduates served well in the War of 1812, during the critical campaign of which, John Adams wrote, "The West Point Engineers doubled the capacity of the little American Army for resistance."

After the War of 1812, the needs of the nation changed, and the young Academy changed with them. Responsible for the innovations at the Academy was Sylvanus Thayer, Superintendent from 1817-1833 and "Father of the Military Academy." The cornerstone of Thayer's philosophy was a demand that cadets possess an excellence of character and an excellence of knowledge. He emphasized habits of regular study, established that every cadet must pass every course or make up his deficiency, and limited classroom sections to from ten to fourteen members. Thayer saw the need of the country for engineers and he established civil engineering as the core of the curriculum, the Military Academy became the nation's first engineering school. Its graduates ranged throughout the globe, applying the engineering principles learned at the Academy to the problems of the new frontiers. Besides undertaking numerous construction jobs necessary to expand the nation's frontiers, Academy graduates also directed such monumental tasks as the construction of the Panama Canal. Thayer's innovations in engineering education led Francis Weyland, President of Brown University from 1827-1855, to say that Military Academy graduates did "more to build up the system of internal improvement in the United States than [the graduates of] all other colleges combined." In October 1965, Thayer was elected to the Hall of Fame of Great Americans at New York University. His insistence on excellence of character and knowledge and many of his educational reforms remain important ingredients of Academy life.

But while improvement in education and excellence in civil engineering were important to the Academy, graduates in the nineteenth century were called repeatedly to serve their country on the fields of battle. The Civil War saw West Point graduates serving with distinction on both sides: Grant, Sherman, Sheridan, Meade, Lee, Jackson, Ewell, and Longstreet, to name a few.



"View of West Point, Looking up the Hudson" c.1845 West Point Museum Collection

During the Civil War period, the education of the Regular Army Officer at West Point underwent continuous changes. The birth of new technical and engineering schools in the United States allowed the Academy to drop its emphasis on a strictly civil engineering curriculum. Also, since several Army postgraduate schools had been established, USMA began to be looked upon as the first step in a continuing Army education.

The Academy's centennial in 1902 signalled the beginning of more changes. A new physical plant was constructed, using the Gothic architectural style. The Honor System grew stronger as cadets, themselves began to administer it. General Albert L. Mills, the Superintendent, reassessed the military and the academic training program curriculum. The academic curriculum underwent a gradual liberalization until the outbreak of World War I; liberal arts subjects — English, foreign languages, history, and the social sciences — were strengthened or added to the course requirements.

In World War I, Academy graduates served with the Allied Expeditionary Forces (to include its commander, General of the Armies John J. Pershing). Although the four-year course at West Point was shortened to meet the demands of the war, it was quickly re-established at four years upon termination of hostilities.

Responsible for the continued development of the Academy after World War I was General of the Army Douglas MacArthur, who became superintendent on 12 June 1919. MacArthur quickly re-established pre-war academic standards. He instituted fundamental changes in the physical fitness and intramural athletic programs and introduced more liberal education into the curriculum. He also eliminated much of the personally degrading physical hazing.

The list of graduates serving in World War II is long and distinguished — Eisenhower, MacArthur, Bradley, Arnold, Clark, Patton and Wainwright — to name but a few. Although the post-World War II period was one of few changes, save reverting again to a four-year course, shortly after the close of the Korean War a comprehensive, four-year, study was made of the entire curriculum and training program. As a result, in 1961, the Academy offered elective study programs for the first time. Curriculum changes continued throughout the 1960's as the Academy sought to continue to provide cadets with a broad educational background and at the same time to offer an increasing number of elective programs to fit expanding cadet interests and aptitudes. For the first time, cadets were allowed to validate courses and substitute electives of their own choosing. Today, although cadets must still complete a basic core curriculum, they may elect to specialize in one of four major study programs.

In 1964, President Johnson signed a bill increasing the authorized strength of the Corps of Cadets from 2529 to 4417. To keep pace with the expanded curriculum

and the increase in the size of the Corps, a major expansion of the Academy's physical plant was begun in mid-1964, and it is expected that the expansion of both the Corps of Cadets and the physical plant of the Academy will be completed in 1972.

The academic and military training program at West Point is a vital one that is continuously examined and adjusted to the changing times. Among the more noted recent West Point graduates are Astronauts Frank Borman, Edwin "Buzz" Aldrin (fifth West Pointer in space and first West Pointer and second human to walk on the moon), and David R. Scott (sixth West Pointer in space and second West Pointer on the moon), all of whose accomplishments exemplify the soundness of the West Point system: a vital, continuously examined and adjusted academic and military training program, built on the cornerstone of the Thayer philosophy — leadership strengthened by excellence of character and knowledge.

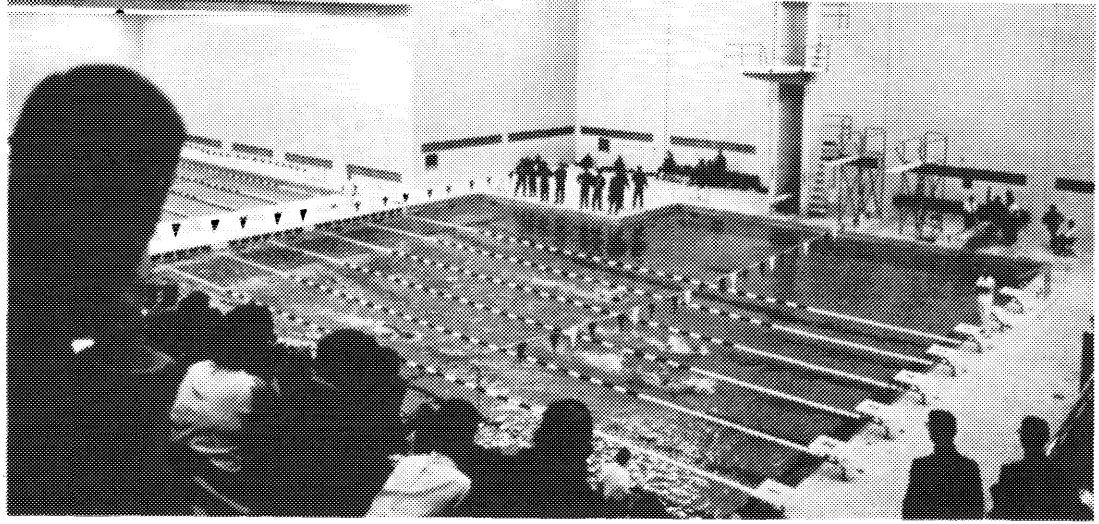
Academy Facilities

The United States Military Academy reservation consists of approximately 16,000 acres, located in Orange County, New York, fifty miles north of New York City. The cadet area, framed by the Hudson Highlands, overlooks the Hudson River at its historic West Point. The main cadet complex retains the harmonious blend of Gothic style architecture and the natural beauty of the surrounding hills.

The focal point of the cadet area is Washington Hall, the cadet dining hall, where the entire Corps of Cadets assembles three times a day for high quality, family style meals. In addition to the dining hall, Washington Hall contains the Offices of the Commandant of Cadets and his staff, two academic departments, classroom facilities, and other cadet support facilities.

Flanking Washington Hall on the north, east, and south is the barracks complex which houses the Corps of Cadets. With the recent completion of new dormitory style barracks, some of which will be occupied for the first time in 1972, cadets now live in comfortable surroundings, two cadets per room. Over half of the cadet rooms have been occupied less than five years. Even the older rooms, however, have been renovated and equipped with modern furnishings.

Thayer, Bartlett, and Mahan Halls, adjacent to the cadet barracks complex, contain the remaining academic departments, classrooms, and laboratory facilities. Thayer Hall, a complete structure built 15 years ago within the walls of the old riding hall, provides 98 classrooms, a computer center, a television studio, 800 seat and 1500 seat auditoriums, the Academy Museum and offices for academic departments. Bartlett Hall contains 73 classrooms, lecture halls, laboratories, and academic department offices. Classes will be held in Mahon Hall for the first time in the fall of 1972. This nine story building contains 74 classrooms, a 600 seat auditorium, engineering and mechanics laboratories, and administrative areas for three academic departments.



The Cadet Library, containing 320,000 volumes, reading rooms, seminar rooms, microfilm and audio visual facilities, and rare book collections, is located within the barracks-academic complex.

The Administration Building, or Post Headquarters, contains the offices of the Superintendent, the Dean of the Academic Board, and the Director of Admissions and Registrar and is also located adjacent to the barracks-academic complex.

West Point provides cadets with outstanding athletic facilities. The gymnasium building houses five gymnasiums and has recently been expanded to provide a new Olympic size swimming pool to complement the existing swimming facilities. In addition to the varsity sport facilities of Michie Stadium for football, Shea Stadium for track, Doubleday Field for baseball, Smith Rink for ice hockey, the Field House for basketball and indoor track, and the new indoor rifle and pistol ranges, numerous athletic fields are located throughout the post. Just as Smith Rink provides a facility for the recreational ice skater and the ice hockey team, the Victor Constant Ski Slope is shared by the intercollegiate, intramural and recreational skier. The golf course is adjacent to the ski area, and multiple tennis courts and outdoor swimming facilities are found throughout the post.

Religious services are held in three separate chapels. The Cadet Chapel (containing the largest church organ in the Western Hemisphere) overlooks the cadet barracks and is used for Protestant services. Catholic services are held in the Chapel of the Most Holy Trinity, a copy of a parish church in County Essex, England. The Old Cadet Chapel at the West Point cemetery entrance is used for Jewish services, Protestant denominational services, and funeral services.

Cadets have numerous clubs and activities for leisure time. Grant Hall, Cullum Hall, the Weapons Room and the First Class Club provide snack bar and lounge facilities for cadets and their guests. The government owned Hotel Thayer provides hotel accommodations for the cadets' friends and families. Additionally, a Cadet Activities Center is now under construction. When

completed, this facility will provide a 4500 seat auditorium, a 1000 seat snack bar, a 1000-person multipurpose ballroom, a Cadet Hostess area, and a large reception area for cadet guests.

Each year hundreds of thousands of tourists visit West Point to observe the Corps of Cadets, the historic memorabilia and the natural beauty of the Academy in its Highlands setting. Visitors are urged to begin their tour at the Visitors Information Center near Thayer Gate where informative literature and suggested tour guidance is available.

SERVICE LIFE

The mission of the United States Military Academy is to develop within each cadet those qualities and attributes essential to his progressive and continued development as a commissioned officer in the Regular Army of the United States, a profession endowed with rich tradition and heritage. Graduation from the United States Military Academy is but the first step in the mental, moral, physical, and professional preparation of this officer.

An officer's military career will include assignments which provide increasingly challenging leadership responsibilities. These assignments will be augmented with postgraduate military and civilian schooling. The assignment pattern is designed to prepare him for his role as a senior officer at a level which will make maximum use of the training and experience received throughout his career.

An officer leads, teaches, guides, counsels. He works with men and ideas. He is in a demanding and responsible field which involves advanced technology, sophisticated weapons, and the international implications of many of his decisions. As a result, the officer today must have a higher intellectual capacity and educational level than ever before.

An officer is given major responsibility at a much earlier age than his contemporaries in most comparable civilian careers. A general career plan consists of four major periods covering thirty years of service.

Basic Military Development. This period includes the first eight years of commissioned service. It is during this period that

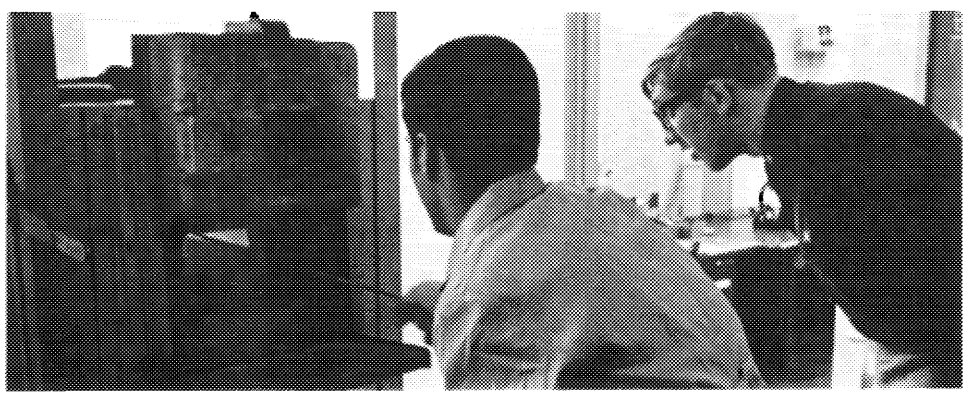
the officer becomes well experienced in the tactics, techniques, and technical requirements of his basic branch. He will receive basic schooling, specialist schooling such as airborne, ranger, or aviation training, serve as a combat arms troop leader, and serve as an instructor. More importantly, he will gain practical leadership experience in the techniques of commanding troops. The early years are considered critical in an officer's career for it is at this time that he develops the lasting traits, attitudes, standards of performance, and sense of duty which will influence his contribution throughout his entire military career. In addition, there is an opportunity for the officer to seek an advanced degree. Approximately 75-80 per cent of the officers in the recently graduated classes can expect to attend advanced civil schooling, depending on service requirements for specialized skills and education.

Intermediate Professional Development. This period normally includes the ninth through the fifteenth years of service. Troop command, staff assignments, schooling, and a variety of assignments of all levels of command typify this period. Eligible officers may attend the Command and General Staff College, the Armed Forces Staff College, and, if not already attended, graduate civil school. This period is designed to broaden the officer's understanding of the overall role of the United States Army and to further his professional development.

Advanced Development. This period usually includes the sixteenth through the twenty-third years of service. The officer will be performing in high level staff and command positions during these rewarding years. Outstanding officers will be offered the opportunity to attend senior service schools such as the Army War College, the National War College, The Industrial College of the Armed Forces, or one of the three foreign War Colleges. During this period truly outstanding officers are identified and selected for promotion to the grade of General Officer.

Major Professional Contribution. This period normally includes the twenty-fourth through the thirtieth years of service. It is during this period, when the officer is at the peak of his military career, that he makes his major professional contribution. His command and staff positions at this time normally will be of the highest responsibility determined by the officer's experience and ability.

The entire military career is one of challenge, satisfaction, and service to country and fellow man. During periods of national emergency the professional officer provides the leadership for which he has been educated and trained, while in time of peace he is the steward of the nation's preparedness. A life of service extends the officer to the limit of his abilities, provides the opportunity to assume positions of important leadership, and instills a sense of pride in the role the officer plays in the Army's portion of our national defense.



Academic Program

MISSION

To provide a broad collegiate education leading to the Bachelor of Science degree.

To build an academic foundation for future graduate study.

To stimulate and challenge intellectual curiosity and individual talents.

To develop powers of analysis, reasoning, and expression.

To contribute to the building of character.

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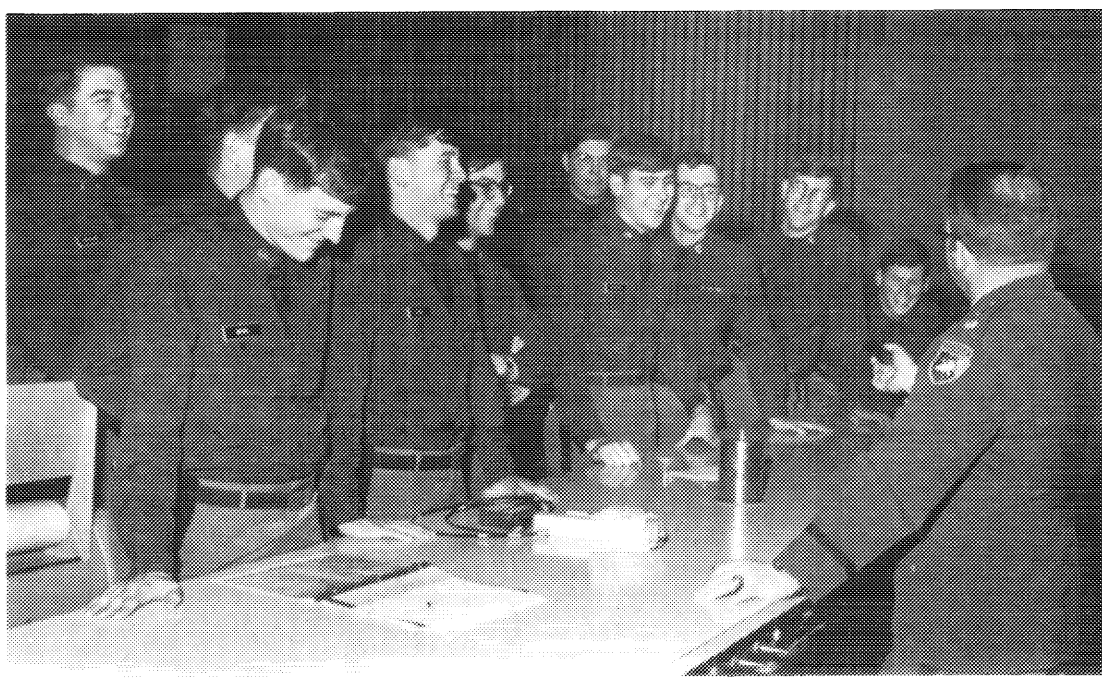
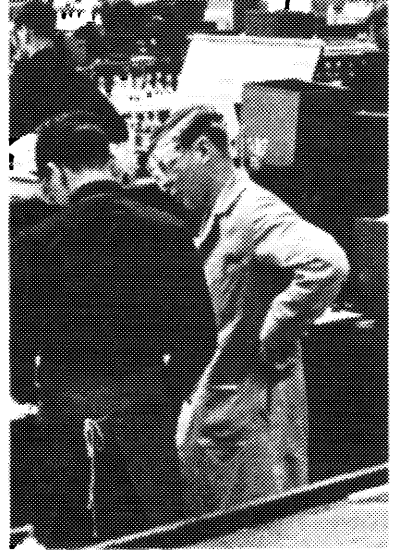




THE EDUCATIONAL PHILOSOPHY OF THE UNITED STATES MILITARY ACADEMY

The United States Military Academy prepares selected young men for service to their country as professional officers of the United States Army. Since it is the only institution of higher learning with this specific mission, its philosophy of education is unique. The Military Academy must produce enlightened military leaders of strong moral fiber whose minds are creative, critical, and resourceful. The academic curriculum and military training encourage logical analysis, clear and concise expression of considered views, and independent thought and action along with a readiness, developed within the framework of military discipline, to carry out orders without reservation once a decision has been reached.

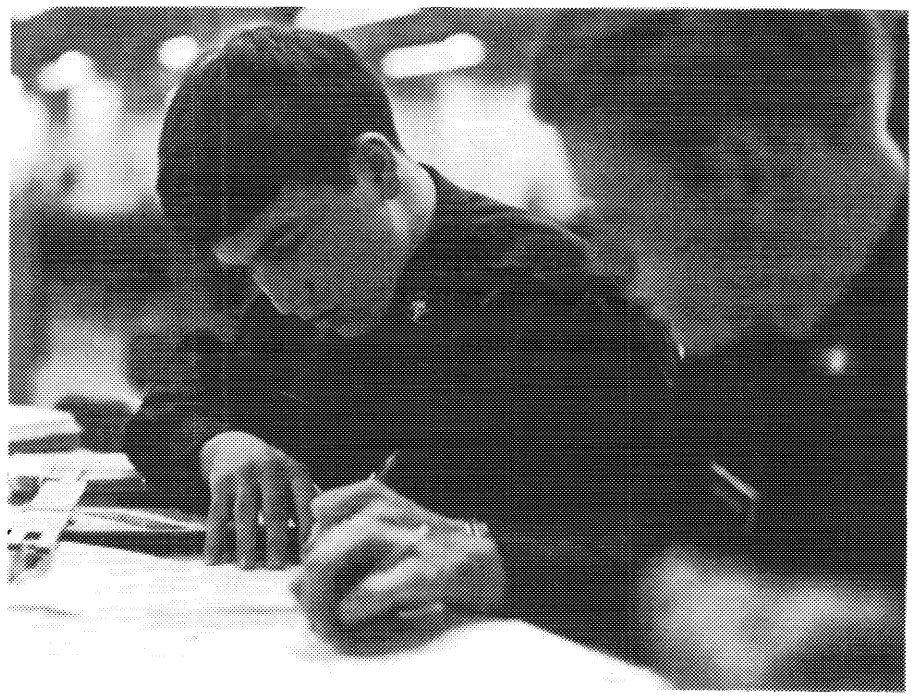
The total curriculum is designed to develop those qualities of character, intellect, and physical competence needed by the officer who is prepared to lead the smallest combat unit or to advise the highest governmental council. The program includes the sciences, the humanities, and military and physical training. It forms a basis both for graduate education and for further professional development.

In the academic curriculum, standard courses provide the essential core of knowledge of mathematics, science, engineering, the social sciences and the humanities and an understanding of the application of this knowledge to the solution of problems. Advanced and elective courses afford the opportunity to develop intellectual capacities and to concentrate in areas of particular interest.

Military training provides the requisite knowledge of professional fundamentals and doctrine and of the basic military skills. Service in positions of responsibility in the Corps of Cadets and participation in intensive summer training provide the opportunity to apply and test principles and to learn techniques by practice and observation.

Fitness for military leadership requires physical strength, agility, stamina, and a competitive spirit. These are acquired from a comprehensive course in physical education and from participation in intra-mural and intercollegiate sports.

The increasing complexity of the world scene requires constant adaptation by the military profession and by the institutions which prepare its leaders. But while adapting itself to the changing world, the Academy must continue to emphasize the devotion to Duty, Honor, and Country which has traditionally been the hallmark of its graduates.



THE ACADEMIC BOARD

The Academic Board establishes standards and procedures for admission, readmission, advanced placement, validation, academic proficiency, advancement from class to class, graduation, and for granting diplomas and commissions. The Board recommends separation of cadets for deficiency in academic studies, in conduct, in physical education, and in aptitude for the service. The Board approves courses of instruction, methods of instruction, schedules of instruction, and changes in institutional facilities.

Lieutenant General William A. Knowlton
Superintendent

Brigadier General John R. Jannarone
Dean of the Academic Board

Brigadier General Philip R. Feir
Commandant of Cadets and
Head of the Department of Tactics

Colonel Walter J. Renfroe, Jr.
Professor and Head of
the Department of Foreign Languages

Colonel Edwin V. Sutherland
Professor and
Head of the Department of English

Colonel John S. B. Dick
Professor and
Head of the Department of Mathematics

Colonel Frederick C. Lough
Professor and
Head of the Department of Law

Colonel Charles H. Schilling
Professor and
Head of the Department of Engineering

Colonel Elliott C. Cutler, Jr.
Professor and Head of
the Department of Electrical Engineering

Colonel Donald G. Mac Williams
Professor and
Head of the Department of Chemistry

Colonel Frederick A. Smith, Jr.
Professor and
Head of the Department of Mechanics

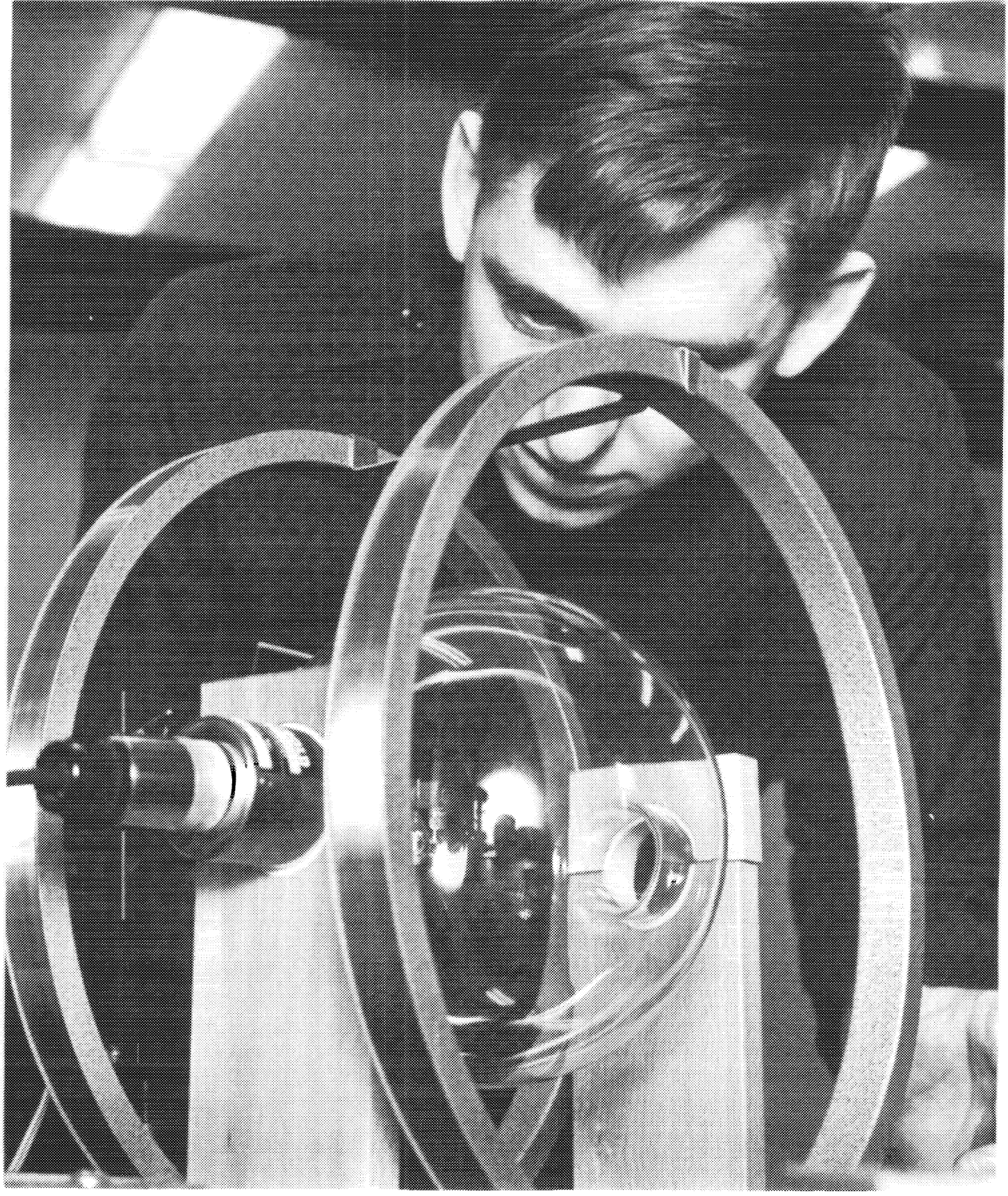
Colonel Thomas A. Griess
Professor and
Head of the Department of History

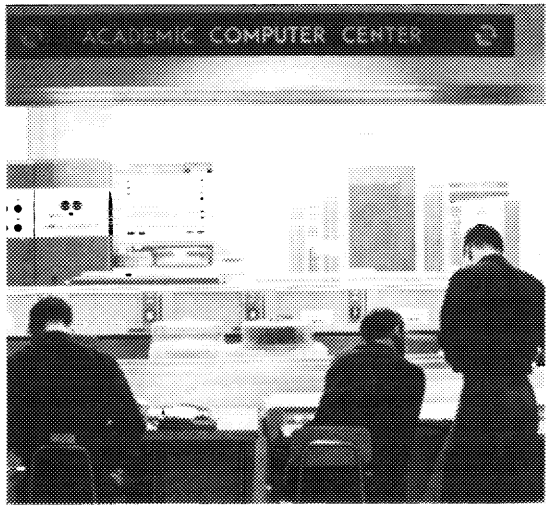
Colonel Edward A. Saunders
Professor and
Head of the Department of Physics

Colonel Lloyd B. McCabe
Professor and Head of
the Department of Military Hygiene

Colonel Gilbert W. Kirby
Professor and Head of the Department
of Earth, Space and Graphic Sciences

Colonel Lee D. Olvey
Professor and Head of
the Department of Social Sciences





THE USMA ACADEMIC CURRICULUM

The curriculum offered at the United States Military Academy, leading to a Bachelor of Science Degree, is the product of an evolutionary development which, over the years, has reflected the changing requirements of the military profession and advances in the field of higher education. It includes a combination of courses from the liberal arts, the humanities, the sciences, and the engineering sciences which, in their aggregate, comprise a basic foundation for a continuing program of education and professional development.

The curriculum consists of two complementary parts: a core program which is essentially prescribed, and an elective program which is, by and large, individually designed. The core program contains the elements of a broad, general education and is designed to give the cadet a fundamental knowledge of the arts and sciences. The elective program enables the cadet to experience a reasonable degree of concentration in areas in which he may have special interests or aptitudes.

The core program and the elective program are, of course, closely linked to one another in the sense that the latter is an extension of the former. Thus, the elective program offers the cadet a number of courses in each of four broad areas which have a substantial basis in the core curriculum. These are the Basic Sciences, the Applied Sciences and Engineering, the Humanities, and National Security and Public Affairs.

In the elective program, the individual student is given the option of concentrating his elective choices in one of these areas or of foregoing a concentration and spreading his selections over the entire spectrum of elective offerings. (Although majors and minors are not identified as such, the careful design of an elective program by an individual cadet can result in his completing the equivalent of a minor and, in some cases, approaching the course requirements for a major as defined at many other institutions.)

Most graduates, as part of their career development as Army officers, receive graduate schooling at civilian institutions within a few years of their graduation from the Military Academy. Therefore, one of the primary aims of the curriculum at West Point is to prepare cadets for later admission to graduate schools in civilian universities in fields ranging from science and engineering to the social sciences and humanities.

ACADEMIC CURRICULUM

Core and Elective Programs (AY 1972-73)

THE CORE ACADEMIC PROGRAM

Fourth Class (Freshman) Year	**First Term**	**Second Term**
*Mathematics	MA 101	MA 106
*English	EN 101	EN 102
†*Foreign Language	L— 101	L— 102
*Environment	EV 101	EV 102
*Engineering Fundamentals	EF 101	EF 102

Third Class (Sophomore) Year			
*Mathematics		MA 205	**MA 206
Physics		PH 201	PH 202
(One sequence to be selected)	or	PH 201	PH 204
*Chemistry		CH 201	CH 202
†*Foreign Language		L— 201	L— 202
English		EN 201	—
*Psychology		—	PL 202
History		HI 201	HI 202
(One sequence to be selected)	or	HI 203	HI 204
Second Class (Junior) Year			
Electrical Engineering		EE 301	EE 304
*Mechanics		ME 301	**ME 302
*Mechanics		ME 303	—
Physics		—	PH 303
	or	—	PH 305
Law		LW 301	LW 302
*Social Sciences		SS 301	SS 302
		Elective	Elective
First Class (Senior) Year			
Engineering		*CE 401	*CE 402
(One sequence to be selected)	or	CE 453	CE 454
	or	*OE 401	*OE 402
	or	EE 401	EE 402
	or	GE 401	GE 402
Leadership		PL 401	—
English		—	EN 402
*Social Sciences		SS 401	SS 407
*History		HI 401	HI 402
		Elective	Elective
		Elective	Elective

*Advanced versions of these courses are offered to qualified individuals by the department concerned.

**Those cadets enrolled in the Humanities and National Security and Public Affairs areas may substitute electives for these courses.

†The Department of Foreign Languages offers programs in Chinese, French, German, Portuguese, Russian, and Spanish.

THE AREAS OF CONCENTRATION AND ASSOCIATED ELECTIVE FIELDS

Applied Science and Engineering:
- Civil Engineering
- Electrical Engineering
- Engineering Mechanics
- Nuclear Engineering
- Weapon Systems Engineering

Basic Sciences:
- Chemistry
- Mathematics
- Physics

Humanities:
- American Studies
- Foreign Language, Chinese
- Foreign Language, French
- Foreign Language, German
- Foreign Language, Portuguese
- Foreign Language, Russian
- Foreign Language, Spanish
- Literature

National Security and Public Affairs:
- Economics
- History
- International Affairs
- Military Studies
- Political Science

Interdisciplinary Field:
- Management

For a detailed analysis of the courses within the areas and fields, refer to pages 87 to 100.

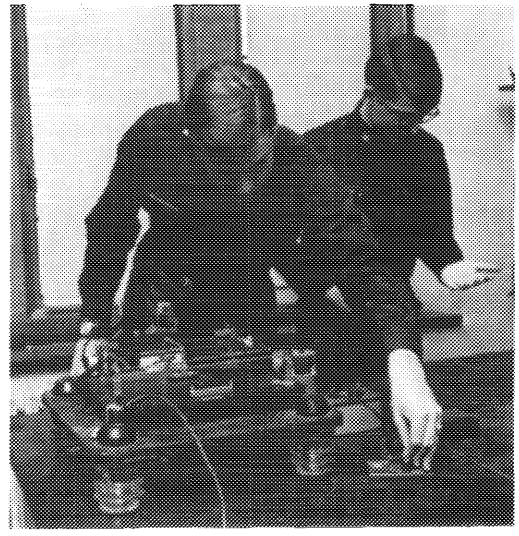
ACCREDITATION

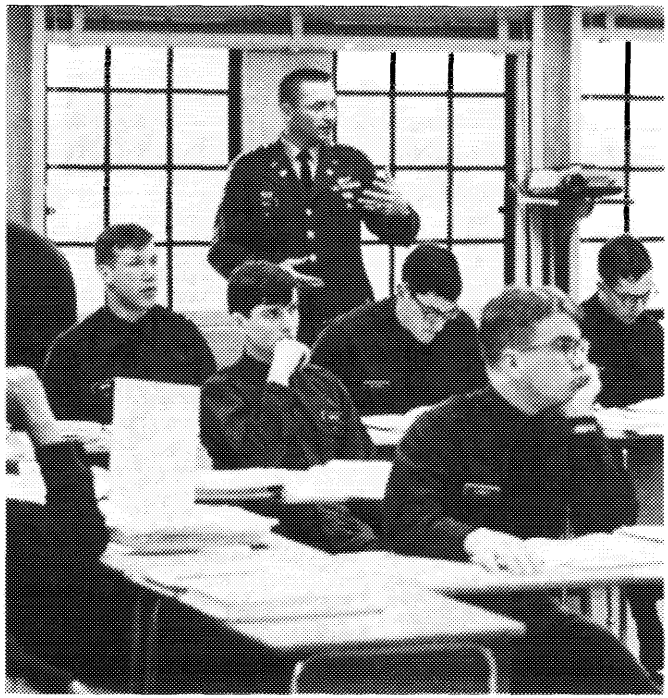
The Military Academy is accredited by the Middle States Association of College and Secondary Schools.

VALIDATION AND ADVANCED PLACEMENT

A cadet who has sufficient knowledge of a subject to meet the appropriate department's requirements, may validate core curriculum courses. College Entrance Examination Board Advanced Placement test results should be submitted for validation consideration. However, validation will not result in a reduction of course load. The cadet is required to complete an elective course in lieu of the validated core course. A cadet who has prior knowledge of a subject, although insufficient for validation, or who demonstrates unusual ability, may be enrolled in an advanced course. Advanced courses normally are more intensive than standard courses and cover a broader range of subject material.

Candidates who have attended other colleges before entering the Academy have many opportunities for advanced study. It is important that a candidate complete the term in which he is enrolled and do as well as possible, so he may take advanced and elective courses.





ELECTIVE COURSES

The academic curriculum provides the opportunity for each cadet to take a minimum of six elective courses. Cadets who receive validation credit for core courses will, at some time prior to graduation, take elective courses in lieu of the core courses. *With approval of the Dean, cadets of the upperclasses may take elective courses in addition to their normal course loads.* The elective courses offered are listed in the following pages.

HONORS COURSES

For selected cadets, Honors Courses are offered.

LISTING OF COURSES

Courses are listed by department. First year courses are numbered in the 100's, second year in the 200's, third year in the 300's, and fourth year in the 400's. The second digit indicates the level of the course. O-standard, 4 or 5-advanced, 7 or 8-elective.

For core courses the third digit indicates the term in which the course is offered; odd digit for first term, even digit for second term. Elective courses may be offered in either or both terms as indicated in the course description. A credit hour represents one hour of classroom instruction and associated preparation per week for an eighteen-week term.

METHODS OF INSTRUCTION

Cadets attend classes in small sections of from 12 to 16 students, so that emphasis may be placed on daily student participation. Cadets are normally assigned to sections on the basis of their demonstrated ability in each subject. The resulting homogeneous grouping enables the instructor to pace his teaching to the capability of the student. Thus the cadet is intellectually challenged and a maximum of learning can take place at all levels. Cadets are resectioned periodically. Regular posting of grades allows the cadet to monitor his academic progress. Reports of each cadet's academic achievement are provided to parents twice each term.

THE ACADEMIC FACULTY

Dean of the Academic Board, Professor
BRIG GEN JOHN R. JANNARONE,
B.S., United States Military Academy;
M.S., California Institute of Technology;
C.E., Columbia University; Army War College

Associate Dean, Associate Professor
COL LEVI A. BROWN,
B.S., United States Military Academy;
M.S., California Institute of Technology;
CE., Columbia University; Army War College

Director, Operations Division, Permanent Associate Professor
COL JOHN W. MASTIN,
B.S., United States Military Academy
M.S., M.E., Harvard University

Assistant Dean for Plans and Programs, Assistant Professor
LTC JAMES B. HALL,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology

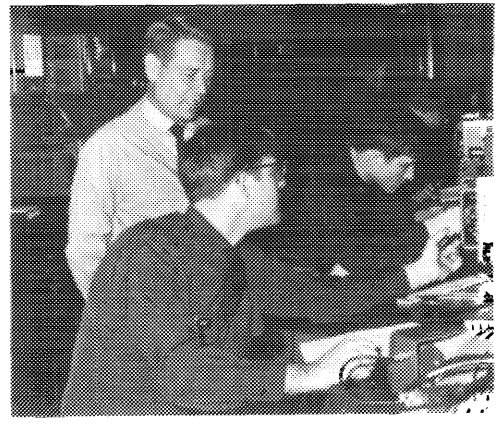
Plans and Programs Officer, Assistant Professor
MAJ DONALD A. BARBOUR,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology

Executive Officer, Assistant Professor
MAJ DENNIS K. CULP,
B.S., United States Military Academy;
M.S., C.E., Massachusetts Institute of Technology

Assistant Executive Officer, Assistant Professor
CPT CLAIR F. GILL,
B.S., United States Military Academy;
M.S., C.E., University of California at Berkeley

Chief, Counselling Branch, Assistant Professor
MAJ ALBERT VANDERBUSH,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology

Counselling Officer, Assistant Professor
MAJ BRIAN V. MCKINLEY,
B.S., United States Military Academy;
M.B.A., Harvard Business School



Department of Chemistry

Professor and Head of Department
COL DONALD G. MacWILLIAMS,
B.S., United States Military Academy;
M.S., Ohio State University;
PhD., Rensselaer Polytechnic Institute

Associate Professors
COL WILFORD J. HOFF, JR.,
B.S., The Citadel;
M.A., Ph.D., Princeton University
LTC GEORGE W. CHANCELLOR,
B.S., United States Military Academy;
M.S., Purdue University;
PhD., Arizona State University

Assistant Professors
MAJ CHARLES H. ARMSTRONG,
B.S., United States Military Academy;
M.S., Pennsylvania State University
MAJ RAY W. BILLS,
B.S., Utah State University;
PhD., Washington State University
MAJ STANLEY M. CLOUGH,
B.S., United States Military Academy;
M.S., Pennsylvania State University
MAJ DAVID L. MUNDT,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ MICHAEL T. O'BRIEN,
B.S., United States Military Academy;
M.S., Johns Hopkins University
MAJ ROBERT C. PALMER,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
CPT JERRY L. SELF,
B.S., North Carolina State University;
M.S., Pennsylvania State University

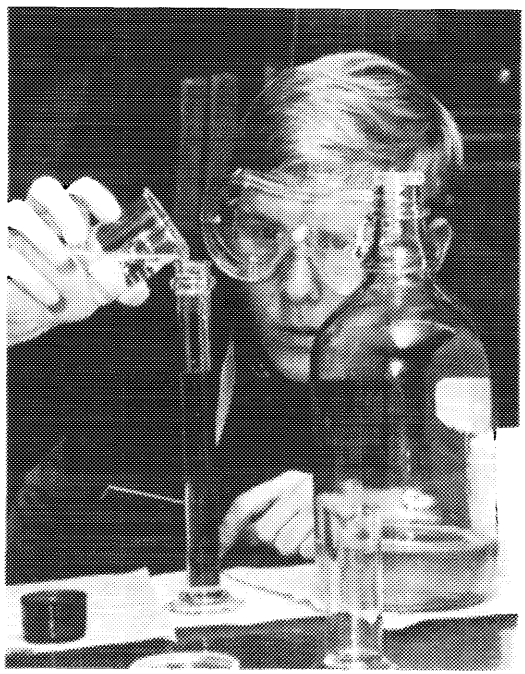
Instructors
MAJ CHALMERS H. ARMSTRONG, III,
B.S., United States Military Academy;
M.S., University of Arizona
MAJ BYRON E. BASSETT,
B.S., United States Military Academy;
M.S., Pennsylvania State University
MAJ JOHN S. HABBLETT,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ DANIEL J. JACKSON, JR.,
B.S., Canisius College;
PhD., Georgia Institute of Technology
MAJ ROBERT F. LANDIN,
B.S., University of Omaha;
M.S., Emory University
MAJ LARRY R. NEEDS,
B.S., United States Military Academy;
M.S., Pennsylvania State University
MAJ KERVIN R. SELLERS,
B.S., Sam Houston State College;
M.S., PhD., Texas A and M University
MAJ ROBERT B. SZYDLO,
B.S., DePaul University;
M.S., Johns Hopkins University
CPT ELLIS R. BROTZMAN,
B.S., Wheaton College;
M.S., University of Chicago
CPT MICHAEL F. DELLEO,
B.S., United States Military Academy;
M.S., Worcester Polytechnic Institute
CPT ROGER C. HIGBEE,
B.S., United States Military Academy;
M.S., Johns Hopkins University
CPT THOMAS C. HIGHTOWER,
B.S., University of Southern Mississippi;
M.S., Johns Hopkins University
CPT JAMES D. HOPKINS,
B.S., United States Military Academy;
M.S., Stanford University

CPT MICHAEL C. MOORE,
B.S., Knox College;
M.S., PhD., University of Colorado
CPT GEORGE F. PALLADINO,
B.S., Sienna College;
M.S., University of Massachusetts
CPT ROBERT C. WHITE,
B.S., United States Military Academy;
M.S., Pennsylvania State University

STANDARD COURSE

CH 201-202 General Chemistry

A two-semester course in general college chemistry with emphasis on the fundamental concepts, principles, theories, and laws of chemistry, to include an introduction to organic and nuclear chemistry. An integrated laboratory program includes practical exercises illustrating fundamental chemical theory discussed in the classroom and an introduction to qualitative analysis. Experiments stress investigative techniques, observation and interpretation of data, and the drawing of conclusions from these data. *7 Credit Hours.*



ADVANCED COURSE

CH 251-252 Advanced General Chemistry with Analysis

A rigorous treatment of the fundamental principles of modern chemistry. Topics covered include elementary quantum theory, atomic structure, the chemical bond, gases, crystal structure, solutions, elementary thermodynamics, kinetics, equilibrium, descriptive chemistry of the elements, electrochemistry, complex ions, and elements of organic and nuclear chemistry. An integrated laboratory program includes experiments of a quantitative nature which illustrate the fundamental concepts of chemistry and a series of semimicro qualitative analysis exercises stressing equilibrium principles and solution chemistry of various elements. *7 Credit Hours.*

ELECTIVE COURSES

CH 383-384 Organic Chemistry

Prerequisites: CH 202 or CH 252, or validation thereof.

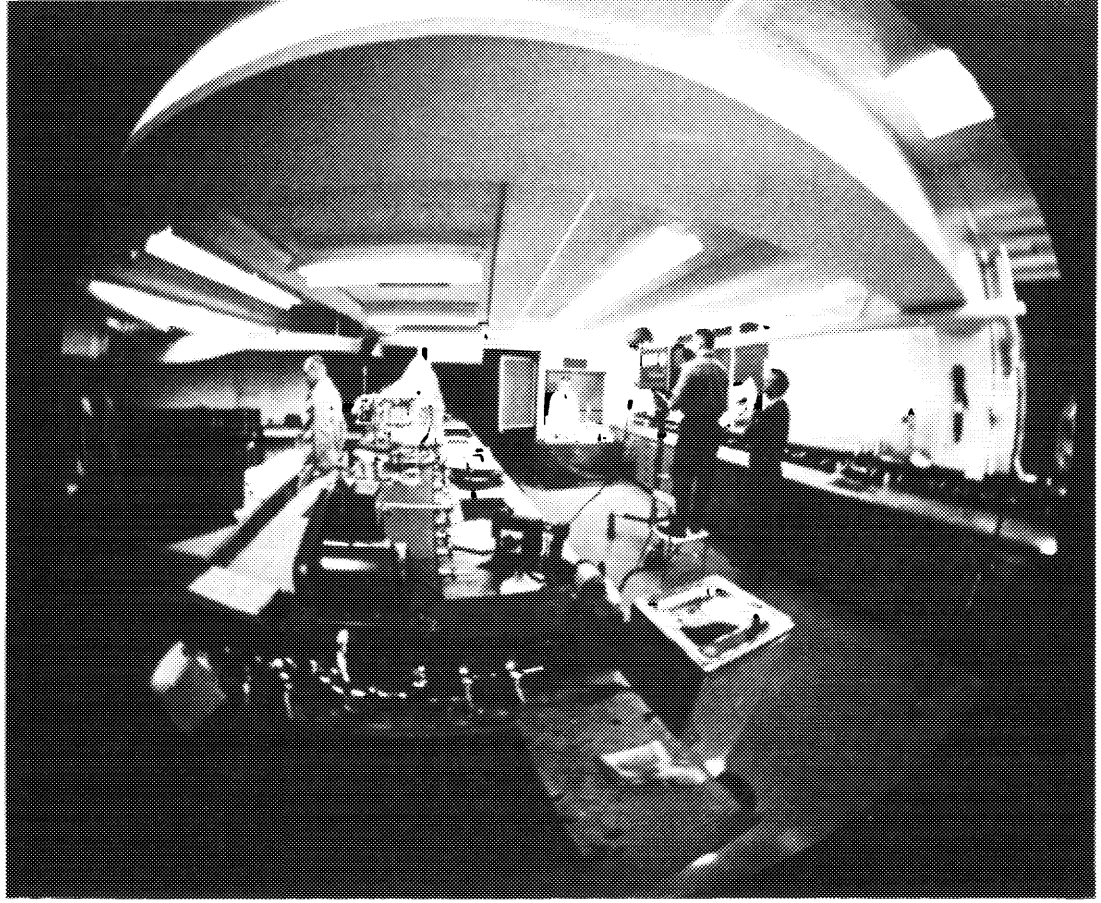
A comprehensive study of the nature, preparation, and reactions of the compounds of carbon. The latest theories of chemical bonding are presented. Emphasis is placed on the relationship of structure to chemical reactivity. The course includes such standard topics in organic chemistry as: aliphatic and aromatic hydrocarbons, alcohols, halides, aldehydes, ketones, acids, and amines, as well as functional derivatives of these classes of compounds. Stereochemistry, reaction mechanisms, and synthesis are also covered in the course. The laboratory program includes the application of modern instrumentation, the typical reactions of functional groups, synthesis, and an introduction to qualitative analysis.

7 Credit Hours.

CH 481-482 Physical Chemistry

Prerequisites: CH 202 or CH 252, or validation thereof.

This course relates certain theoretical aspects to the laws of chemical interaction. The coverage includes such standard topics in physical chemistry as: description of physiochemical systems, chemical thermodynamics, solutions and phase equilibrium, kinetics, changes of state, the phase rule, conductance and ionic equilibria, electro-



chemistry, quantum chemistry, and spectroscopy. The laboratory program includes experiments which illustrate the fundamental topics through precision measurements, including the application of ultraviolet, visible and infrared spectroscopy. The digital computer is extensively used for automatic data reduction and error analysis in laboratory work. *7 Credit Hours.*

CH 485-486 Human Biology

Prerequisites: CH 202 or CH 252, Ph 202 or PH 252, or validation.

This course develops the fundamental principles of human structure and function. With primary emphasis on physiology, it includes sufficient elements of cell morphology and functions, and human anatomy, to preclude the necessity of prior formal training in the biological sciences. Student background in physics and chemistry is utilized to support the inclusion of elements of biochemistry and biophysics in a more advanced approach than is typical of an introductory course in biology. Audio-visual aids, classroom demonstrations, and a small number of laboratory exercises are used to provide some experimental support. *5 Credit Hours.*

CH 489 Chemistry Research Project (Either Term)

Prerequisites: CH 384 and CH 482.

Individually supervised research in a selected problem area. Research projects are approved by the department and require the cadet to outline his approach, determine necessary laboratory equipment, and evolve the techniques and procedures required. The project terminates in the writing of a research paper covering all aspects of the project.

2.5 Credit Hours.

Department of Earth, Space and Graphic Sciences

Professor and Head of Department
COL GILBERT W. KIRBY, JR.,
B.S., United States Military Academy;
M.S., California Institute of Technology;
Army War College

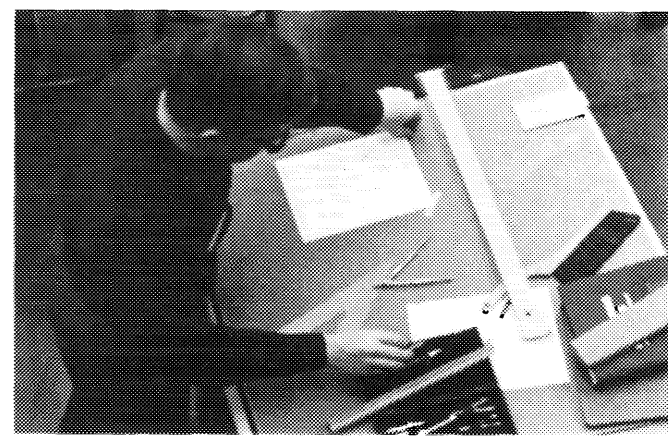
Associate Professors
LTC ALLAN C. BIGGERSTAFF,
B.S., United States Military Academy;
M.S., University of Arizona
LTC JOHN B. GARVER, JR.,
B.S., United States Military Academy;
M.S., Syracuse University
LTC ROBERT A. HEWITT, JR.,
B.S., United States Military Academy;
M.A., Syracuse University
LTC FARRELL G. PATRICK,
B.S., United States Military Academy;
M.A., Ph.D., American University
MAJ RICHARD J. GALLIERS,
B.S., Ohio State University;
M.A., University of Michigan
MAJ CASSIUS J. MULLEN,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology

Assistant Professors
MAJ ARTHUR S. BROWN,
B.S., United States Military Academy;
M.S., Ohio State University
MAJ EDWARD F. BRUNNER,
B.S., United States Military Academy;
M.A., Syracuse University
MAJ PAUL G. CERJAN,
B.S., United States Military Academy,
M.S., Oklahoma State University
MAJ TYRUS R. COBB, JR.,
B.S., United States Military Academy;
M.A., University of Texas
MAJ JAMES B. FAIRCHILD,
B.S., United States Military Academy;
M.A., University of Michigan
MAJ ARPAD A. KOPCSAK, JR.,
B.S., Citadel;
M.S., University of Arizona
MAJ MARK LOWRY, II,
B.S., United States Military Academy;
M.A., Syracuse University
MAJ THOMAS H. MAGNESS, III,
B.S., United States Military Academy;
M.A., University of Wisconsin
MAJ JAMES P. McGINNIS,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology
MAJ ROBERT H. O'TOOLE,
B.S., United States Military Academy;
M.S., Stanford University
MAJ LYNNE M. PATTEN,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology
MAJ ELDON L. PERDEW,
B.S., United States Military Academy;
M.S., University of Southern California
MAJ DAVIES R. POWERS,
B.S., United States Military Academy;
M.S., University of Arizona
MAJ FRANCIS R. SCHARPF,
B.S., United States Military Academy;
M.A., Syracuse University
MAJ STANLEY E. WHITMORE, JR.,
B.S., United States Military Academy;
M.A., Syracuse University

CPT SAMUEL F. CHAMPI,
B.S., United States Military Academy;
M.S., Princeton University
CPT DANIEL H. HORNBARGER,
B.S., United States Military Academy;
M.S., Ohio State University

Instructors

MAJ GEORGE A. DESROCHERS,
B.S., Northeastern University;
M.S., Ohio State University
MAJ DAVID A. DLUZYN,
B.S., United States Military Academy;
M.S., University of Illinois
MAJ ROGER W. FRANKE,
B.S., United States Military Academy;
M.S., University of Southern California
MAJ NILS J. JOHANNESEN,
B.S., M.S., University of Oregon
MAJ WILLIAM E. KELLENBERGER,
B.S., Norwich University;
M.S., Texas A & M University
MAJ DONALD M. LIONETTI,
B.S., United States Military Academy;
M.S., Arizona State University
MAJ ARMANDO LUJAN,
B.S., United States Military Academy;
M.A., University of Oklahoma
MAJ ROBERT L. McGARITY,
B.S., United States Military Academy;
M.A., University of Texas
MAJ THOMAS R. MIDDAUGH,
B.S., United States Military Academy;
M.S., University of Michigan
MAJ DOUGLAS W. MORGAN,
B.S., United States Military Academy;
M.S., University of Southern California
MAJ JOSEPH A. SIMONEAUX,
B.S., United States Military Academy;
M.S., University of Missouri
MAJ KENNETH E. WALL, JR.,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology
CPT RICHARD W. ANDERSCHAT,
B.A., University of Detroit;
M.S., University of Michigan
CPT RICHARD A. BOERCKEL,
B.S., United States Military Academy;
M.A., University of Oregon
CPT ROBERT A. deLAAR,
B.S., United States Military Academy;
M.S., Purdue University
CPT EDMOND L. FAUST, III,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology
CPT JAMES E. FERGUSON,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology
CPT CLAUDE M. FLIGG, JR.,
B.S., United States Military Academy;
M.S., Purdue University
CPT BRUCE L. HOWARD,
B.S., United States Military Academy;
M.S., University of Michigan
CPT CALVIN G. KAHARA,
B.S., United States Military Academy;
M.A., University of Oklahoma
CPT DAVID G. KIRKPATRICK,
B.S., United States Military Academy;
M.S., University of Colorado
CPT ROGER A. LIVINGSTONE,
B.A., St. Francis Xavier University;
M.A., Syracuse University
CPT BERNARD J. MOGAN,
B.S., United States Military Academy;
M.S., Arizona State University
CPT FREDERICK M. POPE,
B.S., United States Military Academy;
M.S., University of Michigan
CPT MICHAEL B. PROTHERO,
B.S., United States Military Academy;
M.A., Rutgers University
CPT ROBERT B. SINCLAIR,
B.S., United States Military Academy;
M.S., University of Southern California
CPT DANIEL E. SPEILMAN, JR.,
B.S., United States Military Academy;
M.A., University of Texas
CPT ROBERT H. TURNER,
B.S., United States Military Academy;
M.S., University of Michigan



STANDARD COURSES

EF 101 Engineering Fundamentals I

First Term — Prerequisites: None

An introduction to the fundamental engineering techniques with emphasis on the engineering approach to problem solving. Illustrative problems in conceptual design provide a means for applying analysis, design, and communication skills, and for practicing slide rule operations. An introduction to surveying is included. Modern engineering materials and manufacturing processes are discussed and demonstrated.

2.0 Credit Hours.

EF 102 Engineering Fundamentals II

Second Term — Prerequisite: EF 101

An introduction to the electronic digital computer with emphasis on programming in the FORTRAN IV language. Practical exercises in the computer laboratory using batch-processing methods and remote terminals develop and reinforce fundamental concepts. Course includes subcourses in graphical analysis, graphical calculus, empirical equations, and vector geometry.

2.0 Credit Hours

EV 101 Planetary Science

First Term — Prerequisites: None

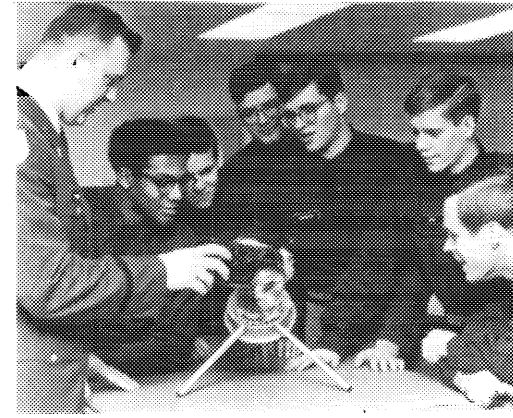
The course treats certain physical aspects of earth and atmospheric science which pertain to the Earth as a planet, man's modification of the planet Earth, and the study of other members of the solar system. The principles of Newtonian mechanics are applied to man's space exploration. Emphasis is given to man and nature's role in changing the face of the Earth and attendant environmental problems. *2.5 Credit Hours*

EV 102 World Regional Geography

Second Term — Prerequisites: None

An introductory study of the complexities and diversities of man's physical and cultural environments. The course consists of three parts: topical geography, and the study of one developed and one developing region of the cadet's choice. This approach is used as a basis for systematically analyzing and comparing selected contemporary world regions of greater individual interest while still meeting course objectives.

2.5 Credit Hours.



ADVANCED COURSES

EF 151 Advanced Engineering Fundamentals I

First Term — Prerequisites: Demonstration of a satisfactory degree of proficiency in engineering graphics by passing a special placement examination. Offered in lieu of Engineering Fundamentals 101.

An introduction to the electronic digital computer with emphasis on programming in the FORTRAN IV language. Practical exercises in the computer laboratory using both batch-processing methods and remote terminals develop and reinforce fundamental concepts. Course includes subcourses in graphical analysis, an introduction to plane surveying, and the practical use of the slide rule. *2.5 Credit Hours.*

EF 152 Advanced Engineering Fundamentals II

Second Term — Prerequisite: EF 151

The course permits a cadet to investigate and solve basic engineering-type problems as an individual and as a member of a team. Problems are derived from architecture and engineering design with emphasis on graphical techniques as a means of analysis and communication. The course is concluded with oral and written presentations of solutions by the cadet teams.

2.5 Credit Hours.

EV 151 Advanced Planetary Science

First Term — Prerequisite: Strong foundation in physics, astronomy, or earth sciences.

An advanced course for selected cadets with high aptitude for physics, astronomy, or earth sciences. The course encompasses the subject matter of EV 101, but coverage is accelerated and in greater depth with additional studies in astronautics, geophysics, and environmental problems.

2.5 Credit Hours.

EV 152 Advanced Environment

Second Term — Prerequisite: Demonstration of a satisfactory degree of proficiency in geography by passing a special placement examination.

An advanced course for selected cadets which gives an expanded, in-depth coverage of geographic concepts and methods for analysis of major world culture regions. Emphasizing the variety of physical and human factors shaping man's perception and use of his environmental resources, the cadet traces the origins, development, and spatial organization of the major world culture regions. Extensive use is made of case studies. *2.5 Credit Hours.*

ELECTIVE COURSES

EF 382 Computer Science Fundamentals

First and Second Term — Prerequisite: EF 102 or 151

A comprehensive study of selected computer science topics with emphasis on programming in the FORTRAN IV language. Use of computer simulation as an aid to decision making in military, business, and engineering operations. Included are the simulation techniques of the Monte Carlo method, random number generations, and a study of information retrieval. Magnetic tape operations and graphical output techniques are introduced. *2.5 Credit Hours.*

EF 383 Data Control and Processing with Cobol

First and Second Term — Prerequisite: EF 102 or 151

A comprehensive introduction to the COBOL programming language and its application to large-scale data control and processing techniques. The course includes the COBOL programming techniques for creating, maintaining and processing files of management data, the structure of data files necessary to accommodate large volumes of information, and the fundamentals of information control and retrieval systems. *2.5 Credit Hours.*

EF 384 Principles of Surveying

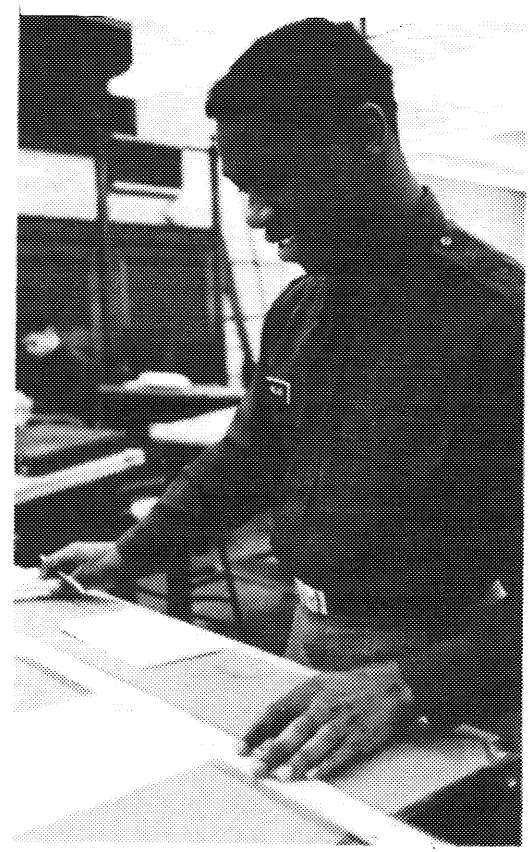
Second Term — Prerequisite: EF 101-102 or 151

This course provides a foundation in the principles of surveying in sufficient depth to permit application to military mapping, construction surveying, artillery firing, optical tooling, and forms for further study in related engineering fields. Course includes a familiarization with the instruments and equipment used in modern civil and military surveying and the theoretical concepts of measurements, probability, and errors, celestial observations, tachymetry, and photogrammetry. *2.5 Credit Hours.*

EF 385 Cartography

Second Term — Prerequisites: EF 101-102 or 151

This course provides an understanding of the principles and methodologies employed in modern cartographic techniques. The focus is on the planning for, gathering, analysis, design, and presentation of both real and abstract data in visual form. The second half of the course allows for an individual project in a cartographic area of the cadet's choice. *2.5 Credit Hours.*



EF 489 Individual Computer Science Project

Second Term — Prerequisites: EF 382 or 383 and permission of the Head of Department.

The course permits advanced or specialized study in meaningful problem areas subject to solution on the electronic digital computer using advanced programming techniques.

2.5 Credit Hours.

EV 381 Geography of the USSR

First Term — Prerequisite: EV 102

A comprehensive treatment of the physical, population, and economic geography of the USSR. Soviet man-land relationships are examined in a regional framework, emphasizing the complexity and diversity of the physical and cultural environments and USSR potential for economic growth. *2.5 Credit Hours.*

EV 382 Geography of the People's Republic of China

Second Term — Prerequisite: EV 102

A study of the physical and cultural environments of mainland China, emphasizing the physical and resource base, spread and development of early Chinese civilization, current population problems and agricultural-industrial patterns. Included is a comparative analysis of pre-1949 and post-1949 economic development and potential for continued economic growth. *2.5 Credit Hours.*

EV 383 Space Science

Second Term — Prerequisites: EV 101-102.

A study of the basic concepts underlying geophysics and astrophysics through a detailed examination of the solar system, including both description and analytical views of man's potential environment beyond Earth, incorporating recent discoveries made in the various space sciences.

2.5 Credit Hours.

EV 384 Regional Geography of the United States

First Term — Prerequisite: EV 102.

A systematic study of the physical and cultural geography of the United States, emphasizing significant aspects of the physical environment, historic and contemporary settlement, and agricultural-industrial patterns which illuminate regional cultural variation and economic interdependence. Also examined is the impact of an urban-industrialized economy on resource utilization and related man-environment problems.

2.5 Credit Hours.

EV 385 Issues Confronting Man and His Environment

First and Second Term — Prerequisite: EV 101-102.

A geographical approach toward the study of the man-environment ecosystem emphasizing technological man's continuing use and misuse of his physical and biotic resources. Case studies in air and water pollution, population-resource balances, urban-industrial complexities, and conflicting views concerning environmental management and problem solving are examined in detail. Field trips provide first-hand exposure to environmental problems in the Mid-Hudson Valley and New York Metropolitan Area. *2.5 Credit Hours.*

EV 388 Physical Geology

Second Term — Prerequisite: EV 101-102.

A course treating the fundamental principles of physical geology with emphasis on the Earth's primary features and the processes which produce and modify them. Topics include the nature and origin of Earth materials, the composition and structure of the Earth, and the development and description of surface landforms. Local field trips are included. *2.5 Credit Hours.*

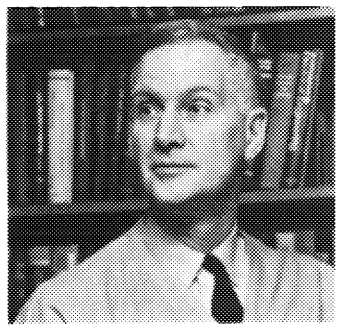
EV 489 Individual Research Project

Either Term — Prerequisites: Completion of one elective in related subject and permission of Head of Department.

Research projects focused on geographic and environmental problems are designed to support individual student interest and background.

2.5 Credit Hours.

Department of Electrical Engineering

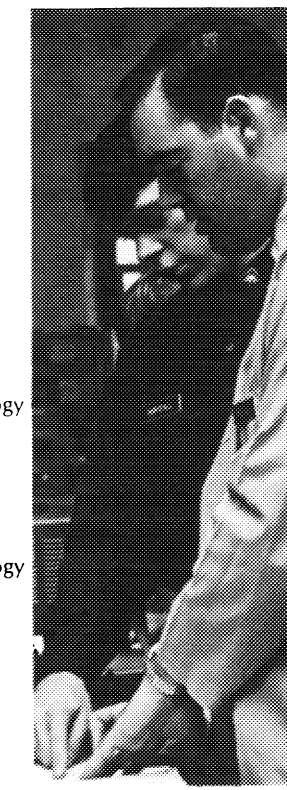


Professor and Head of Department
COL ELLIOTT C. CUTLER, JR.,
B.S., United States Military Academy;
M.S.E.E., Ph.D., Georgia Institute of Technology

Associate Professor and Deputy Head of Department
COL ROBERT B. ANDREEN,
B.S., United States Military Academy;
M.S.E.E., Ph.D., Georgia Institute of Technology
(Acting Deputy)
COL STANLEY E. REINHART, JR.,
B.S., United States Military Academy;
M.S.E.E., Ph.D., Georgia Institute of Technology
(Sabbatical Leave-AWC)

Associate Professors
LTC THOMAS E. OLSON,
B.S., United States Military Academy;
M.S.E., Purdue University
LTC JOHN J. RAMSDEN,
B.S., United States Military Academy;
M.S.E., Purdue University

Assistant Professors
MAJ GORDON W. ARBOGAST,
B.S., United States Military Academy;
M.S.E.E., Georgia Institute of Technology
MAJ ROBERT BRUCE,
B.S., United States Military Academy;
M.S.E.E., Georgia Institute of Technology
MAJ GERALD CHAPMAN, JR.,
B.S., United States Military Academy;
M.S.E.E., North Carolina State University
MAJ WILLIAM J. D'AMBROGIO,
B.S., Pratt Institute
M.E.E., Stevens Institute of Technology
MAJ DAVID K. SALLEE,
B.S., United States Military Academy;
M.S.E.E., University of Michigan
MAJ CYRUS N. SHEARER,
B.S., United States Military Academy;
M.S.E.E., Georgia Institute of Technology
CPT CLARENCE R. LONGCOR,
B.S., M.S, Ph.D., E.E., South Dakota School of Mines and Technology



Instructors
LTC JOHN H. PECKHAM,
B.S., United States Military Academy;
M.S.E.E., University of Texas, El Paso
MAJ RALPH W. GARENS,
B.S., United States Military Academy;
M.S.E.E., Purdue University
MAJ JEFFERSON B. McCARTHY,
B.S., United States Military Academy;
M.S.E.E., University of Arizona
MAJ JAMES P. MELLIN,
B.S., United States Military Academy;
M.S.E.E., Georgia Institute of Technology
MAJ MARTIN J. MICHLIK,
B.S., United States Military Academy;
M.S.E.E., University of Illinois
MAJ NICOLAS R. VAY,
B.S., United States Military Academy;
M.S.E.E., Georgia Institute of Technology
CPT GABRIEL C. ARMIJO,
B.S., University of Texas;
M.S.E.E., University of Alabama
CPT DAVID R. BROWN,
B.S., United States Military Academy;
M.S.E.E., Purdue University
CPT JAMES E. CORNELL,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology
CPT JAMES T. DOYLE,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology

CPT DAVID A. GABEL,
B.S., United States Military Academy;
M.S.E.E., Stanford University
CPT ROBERT D. ROOD,
B.S., United States Military Academy;
M.S.E.E., Purdue University

STANDARD COURSES

EE 301 Electric Circuits

First Term — Prerequisites: PH 202; MA 202, MA 206 or MA 207.

This course is designed to provide cadets with a basic background in electric circuit theory. It begins with a study of electric circuit fundamentals to include charge, current, voltage, Kirchhoff's Laws, and Ohm's Law. This is followed by application of these fundamentals to resistive networks and methods of network solution. Inductance, capacitance, and the impedance concept are then introduced to provide a detailed study of AC circuit analysis techniques. Lectures on physical electronics and magnetic circuits supplement this material. Extensive laboratory work throughout the course emphasizes the fundamentals studied and provides a practical working knowledge.

3.5 Credit Hours.

EE 304 Electronics

Second Term — Prerequisite: EE 301.

This course is designed as a continuation to EE 301 and provides the necessary background for continued work in the EE field. A study of power and transformer action is followed by a study of linear networks, diode circuits, triode and transistor parameters, equivalent circuits, frequency response, modulation, detection, amplifiers and oscillators. A lecture series accompanies the course to introduce the basic principles of communications systems, electro-magnetic waves, antennas, modulation, and radar. Extensive use of laboratory work is made throughout the course.

3.5 Credit Hours.

EE 401 Electronic Circuits

First Term — Prerequisite: EE 304.

A study of transistor circuits, biasing and stabilization, multielectrode tubes and semi-conductors, Laplace transform, response of amplifiers, coupling, compensation, inductive coupling and tuning, classification of amplifiers, thermal conduction and runaway, complementary symmetry, feedback, and oscillators. Emphasis throughout the course is placed upon design, laboratory construction, and testing of practical circuits.

3.5 Credit Hours.

EE 402 Automatic Control Systems

Second Term — Prerequisite: EE 304.

A study of the composition of linear servomechanisms, transfer functions, block diagrams, time and frequency domains, dynamic analysis of systems, Routh-Hurwitz criteria, Nyquist and Bode diagrams, Nichols charts, root-locus plots, performance criteria, steady-state errors, stability, and stabilization and compensation. Laboratory work using an electromechanical servo-trainer system is scheduled throughout the course.

3.5 Credit Hours.

ELECTIVE COURSES

EE 382 Electromechanical Energy Conversion

Second Term — Prerequisite: EE 301.

A study of the basic principles of electromechanical energy conversion through a review of magnetic circuits, the principle of virtual work and its application to rotating and translating devices, DC generators and motors, alternators, synchronous motors, induction motors, the general machine, the reluctance motor, and the metadyne. The course concludes with an introduction to feedback control systems and use of Lagrangian analysis. Extensive laboratory work throughout the course demonstrates the application of fundamental principles. *3.5 Credit Hours.*

EE 383 Electromagnetic Fields

First Term — Prerequisites: PH 202 and completion or validation of entire core math sequence.

A study of static electric and magnetic fields, and time-varying electromagnetic fields using the techniques of vector analysis. After a brief review of vector analysis, the course covers Coulomb's Law and electric field intensity, electric flux density, Gauss's Law, and divergence, energy and potential in the electrostatic field, conductors, dielectrics and capacitance, experimental mapping methods, Poisson's and Laplace's Equations, the steady magnetic field, magnetic forces, materials, and inductance, time-varying fields and Maxwell's

Equations, and the uniform plane wave. Selected applications of electromagnetic field theory are then covered including transmission lines, cavities, radiation and antennas, propagation and radar. A limited amount of laboratory work is scheduled. *3.5 Credit Hours.*

EE 483 Digital Computer Systems

First Term — Prerequisite: EF 102 or EF 152.

A study of the composition, logical organization, interconnection and operation of the functional elements of a digital computer system. Although emphasis is placed on concepts, laboratory exercises provide for "hands-on" familiarization with computer hardware and individual operation of a small-scale computer. Programming exercises are used to demonstrate hardware-software interface. *2.5 Credit Hours.*

EE 484 Communications Systems

First Term — Prerequisite: EE 304 and completion or validation of entire core math sequence.

A study of basic concepts of frequency and time domains, types of modulation, network analyses, elements of information theory, noise sources and noise figure, pulse systems, signal to noise ratio, and applications to communications and radar systems. Laboratory work includes several selected exercises illustrating these concepts. *2.5 Credit Hours.*

EE 485 Computer Engineering

Second Term — Prerequisite: EE 304.

A study of the basic elements used in digital computers, and the manner in which they are interconnected to perform logic operations; circuit families used in the realization of gates, inverters, and flip-flops; economical design of combinational and sequential networks; and structure of computer functional elements for storage and manipulation of data. Laboratory exercises throughout the course provide familiarity with basic circuits as well as the details of logic module interconnection for realization of complex functions. *2.5 Credit Hours.*

EE 486 Solid-State Electronics

Second Term — Prerequisites: EE 304 and PH 303.

A study of band structure of semiconductors, density of states, Fermi level, mobility, lifetime, recombination and trapping, diffusion and drift, space charge, optical behavior, surface properties and thin films, single-junction devices, including rectifiers, avalanche diodes, field-effect transistors, tunnel diodes, and photodiodes, transistors and multiple-junction devices, fabrication techniques, thin-film networks, and integrated solid-state circuits. Laboratory work throughout the course emphasizes the practical analysis of solid state circuitry. *2.5 Credit Hours.*

EE 489 Advanced Topics in Electrical Engineering

Either Term — Prerequisites: EE 304 and permission of the Department.

This course provides the opportunity to pursue the study of Electrical Engineering at a higher level than the standard and other elective courses. The detailed subject matter will reflect the interests of the cadets enrolled. Instruction may be in the form of an individual research project, or a formal tutorial course. *2.5 Credit Hours.*

Department of Engineering

Professor and Head of Department
COL CHARLES H. SCHILLING,
B.S., United States Military Academy;
M.S., University of California;
Ph.D., Rensselaer Polytechnic Institute

Associate Professors
COL WILLIAM K. STOCKDALE,
B.S., United States Military Academy;
M.S., Ph.D., University of Illinois
LTC WILLIAM F. CARROLL,
B.S., United States Military Academy;
M.S., Ph.D., University of Illinois

Assistant Professors
LTC DAVID E. WHEELER,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology
MAJ WILLIAM M. BOICE,
B.S., United States Military Academy;
M.S., Arizona State University
MAJ KARL M. HENN,
B.S., United States Military Academy;
M.S., University of Michigan
MAJ DELMAN A. JOHNS,
B.S., University of Wyoming;
M.S., University of Arizona
MAJ WILLIAM J. SCHUMACHER,
B.S., Lafayette College;
M.S., Penn State University
MAJ FRANCIS W. WANNER,
B.S., United States Military Academy;
M.S., Stanford University

Instructors
MAJ DANIEL P. BUONO,
B.S., University of Omaha;
M.S., University of Tennessee
MAJ JOSEPH A. JASCEWSKY,
B.S., United States Military Academy;
M.S.E.S., Purdue University
MAJ JOHN A. KNUTZEN,
B.S., United States Military Academy;
M.S.C.E., University of California (Berkeley)
MAJ DONALD E. LANDRY,
B.S., United States Military Academy;
M.S.C.E., Texas A&M University
MAJ DWAYNE G. LEE,
B.S., United States Military Academy;
M.S., Air Force Institute of Technology
MAJ EDWIN S. LELAND, JR.,
B.S., United States Military Academy;
M.S., United States Naval Postgraduate School
MAJ JEROME A. POGORZELSKI,
B.S., United States Military Academy;
M.S.M.E., University of Michigan
MAJ ARTHUR J. RYAN, III,
B.S., United States Military Academy;
M.S.M.E., University of Pittsburgh
MAJ CARL B. SCIPLE,
B.S., United States Military Academy;
M.S., University of California
MAJ ALAN H. SCOTT,
B.S., United States Military Academy;
M.S.C.E., University of Illinois
MAJ THEODORE T. VANDER ELS,
B.S., United States Military Academy;
M.S.C.E., Massachusetts Institute of Technology
MAJ WALTER K. WILSON, III,
B.S., United States Military Academy;
M.S.C.E., Texas A&M University
CPT LARRY J. BRAMLETTE,
B.S., United States Military Academy;
M.S.M.E., University of Pittsburgh
CPT SAMUEL M. BURNEY, JR.,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology

CPT GARY A. CECCHINE,
B.S., United States Military Academy;
M.S.M.E., University of Pittsburgh
CPT RAYMOND E. KNELL,
B.S., United States Military Academy;
M.S.C.E., University of Illinois
CPT JOHN E. LONGHOUSER,
B.S., United States Military Academy;
M.S.M.E., Steven's Institute of Technology
CPT WILLIAM S. MILLER,
B.S., United States Military Academy;
M.S.A.E., and M.S.M.E., University of Southern California
CPT JOHN SCHAUFELBERGER,
B.S., University of Idaho,
M.S., University of Illinois
CPT FRANCIS R. SKIDMORE,
B.S., United States Military Academy;
M.S.C.E., Sanford University

STANDARD COURSES

CE 401 Structural Analysis

First Term — Prerequisite: ME 303 or ME 353.

A study of the analysis of stresses and deflections in statically determinate and indeterminate structures. The course treats the determination of reactions, shear, bending moment and axial force as well as the use of influence lines to determine optimum load placement. Structures analyzed include two- and three-dimensional trusses, beams, frames, arches and cables. Statically indeterminate structures are analyzed by approximate and analytical methods, including moment-area theorem, virtual work, slope deflection, and moment distribution. Several computer applications are included, and the role of analysis in the design and decision-making process is emphasized.

3.5 Credit Hours

CE 402 Structural Design

Second Term — Prerequisite: CE 401.

A study of the theory of design and its application to structural engineering problems. Systems engineering concepts, to include modeling and optimization, are introduced. Structural design, based on modern practice in steel structures, includes treatment of steel tension members, columns, beams, beam-columns, and connections. Design of timber members and connections is also studied. The course features a comprehensive design problem which progresses from a basic engineering requirement through the development of a structural concept and the optimization of several design parameters to the detailed design of structural members. The problem requires creative thought as well as application of principles of analysis, synthesis and design studied previously. The entire course emphasizes the engineering philosophy and the decision-making process. *3.5 Credit Hours.*

GE 401-402 General Engineering

Prerequisites: ME 301 and ME 303.

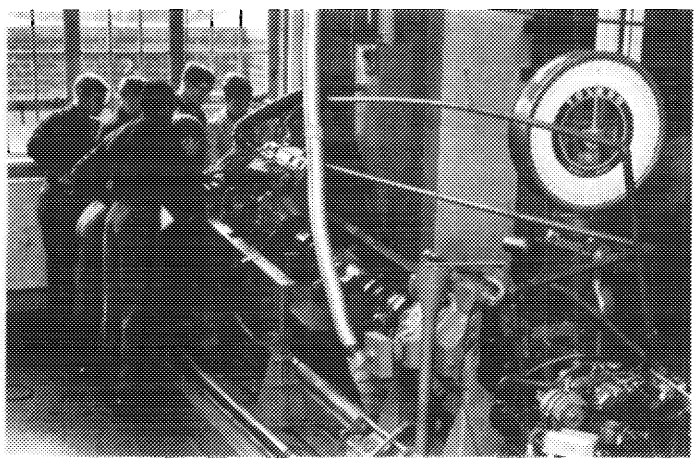
This course is designed to develop an understanding of the philosophy of engineering, and an ability to apply logical reasoning processes specifically to engineering problems, and generally to all problems. The course covers an introduction to systems engineering; weapon system engineer-

ing, emphasizing the study of ballistic and rocket systems; and civil engineering systems, which include a study of structural analysis and the design of structures. A comprehensive engineering design problem follows the preesntation of course material. This project emphasizes the application of the design process and some optimization techniques leading to the "best" solution for a total engineering system. The final phase of this course is devoted to military oriented subjects such as a brief course in concrete and timber design. *7 Credit Hours.*

OE 401-402 Weapon Systems Engineering

Prerequisites: ME 301 and ME 303.

Weapon Systems Engineering is a design course in which small groups of cadets conduct preliminary design of major weapon system components, such as rocket nozzles, gun tubes, recoil mechanisms and vehicular gear trains. As a basis for these design tasks, instruction is given on such subjects as sources of energy, engineering materials, analog computers, ballistics, flight simulation, guidance and control, rocket engines, internal combustion engines, vehicular power trains, terramechanics and concepts of systems engineering. The course is concluded with a weapons systems design study in which a proposed new army weapon system is analyzed against realistic requirements. Laboratory exercises and guest lecturers are integrated throughout the course. *7 Credit Hours.*



ADVANCED COURSES

CE 451 Honors Course in Structural Analysis

First Term — Prerequisites: ME 303 or ME 353 (ME 384 is recommended).

Standing in top 10% of class plus having a demonstrated ability in mathematics, physics and engineering mechanics. Permission of the Head of Department.

In this course the topics cited in CE 401 are covered at an accelerated pace — the pace to be determined by the cadet's individual ability. He is excused from regular classes but meets as required with his advisor on a tutorial basis. Teaching techniques, emphasizing individual study, normally used for graduate studies are employed. Time saved by accelerated study is used to cover each subject in more depth. Additional material includes: numerical integration for shear, moment, and deflection; conjugate beam theory; advanced topics in slope deflection and moment distribution; Castigliano's Theorem; theorem of least work; matrix methods; and the use of digital computers in the solution of structural analysis probelms. *3.5 Credit Hours.*

Note: Interested cadets should contact the department early in the semester preceding the term in which they desire to take the course. The best qualified volunteers, as determined by the Head of the Department, will then be enrolled in CE 451-2.

CE 452 Honors Course in Structural Design

Second Term — Prerequisite: CE 451.

In this course the topics cited in CE 402 are covered at an accelerated pace. (See CE 451 description for procedures). Time saved by accelerated study in this course is used to accomplish an individual analytic and/or laboratory project selected by the cadet in accordance with his personal interest. *3.5 Credit Hours.*

CE-453-454 Introduction to Nuclear Engineering

Prerequisites: ME 301, PH 303, MA 205-206, PH 487; or the equivalent advanced courses. PH 487 may be taken concurrently with CE 453.

This course introduces the student to the release, control, and utilization of energy from nuclear sources. Nuclear Engineering is treated as an

interdisciplinary subject, drawing on the student's background in physics, mathematics, and related engineering science courses. Emphasis is placed on the engineering philosophy involved in the transition from scientific theory to the satisfaction of the needs of society. Major topics covered in the course are: systems engineering, reactor systems, reactor design, heat transfer, radiation shielding, health physics and engineering economics. Other aspects of nuclear engineering such as nuclear explosives, neutron activation, radiation dosimetry, and application of radioisotopes in medicine are investigated by means of class seminars, guest speakers, and experiments at an operating research reactor. A large part of the second term is spent on a comprehensive design problem which gives firsthand experience in creative engineering as well as insight into the difficulties in designing an optimum system.
7 Credit Hours.

OE 451-452 Honors Course in Weapon Systems Engineering
Prerequisites: ME 301 and ME 303. Standing in top 10% of class. Permission of the Head of Department.
In this course the topics cited in OE 401-402 are covered at an accelerated pace. A minimum of one class per week is scheduled in lieu of regular class attendances. Teaching techniques normally used for graduate studies are employed, emphasizing individual study and research. The time gained is used to cover one or more advanced topics or an individual analytical and/or laboratory project of cadet choice, subject to approval of subject and scope of project. *7 Credit Hours.*

ELECTIVE COURSES

CE 381 Soil Mechanics
Either Term — Prerequisite: ME 303 or ME 353.
A study of the fundamentals of soil mechanics and their application to engineering problems. The introductory lessons focus on understanding the composition and structure of granular and clay soils. Permeability, compaction, stress distribution, consolidation, shear strength, and bearing capacity are studied. This knowledge, coupled with the principles of engineering mechanics and mathematics, is applied in solving practical problems in settlement prediction, calculation of seepage, stability of earth dams and embankment, design of footings and pile foundations and retaining walls. Basic laboratory work on Atterberg limits, compaction, unconfined compression, flow net and other tests is included. *2.5 Credit Hours.*

CE 382 Engineering of Environmental Systems
Either Term — Prerequisite: EV 385.
Recognizing the role of the engineer to provide for the engineering needs of a region, this course introduces environmental engineering as a systems approach to engineering analysis and design. Engineering problems directly associated with current environmental issues are analyzed from a planning or managerial viewpoint, with emphasis on engineering decisions which apply an environmental systems approach. Topics studied include land-use planning and transportation, water management, air pollution, and energy production. *2.5 Credit Hours.*

CE 481 Design of Concrete Structures
Either Term — Prerequisites: ME 303 or ME 353, CE 401 or CE 451 (may be taken concurrently) (ME 384 is recommended).
A study of the theory of reinforced concrete design and analysis, including concrete as a material, laboratory investigations and demonstrations, and the design and analysis of conventional structural elements. The scope includes beams, continuous one-way and two-way slabs, eccentrically loaded columns, retaining walls, and footings. Ultimate strength theory is emphasized. The course culminates in an engineering design problem which utilizes most of the material covered in the course. A small number of selected cadets taking

this course in the first term may participate in a research project during the second term under Course CE 489. Application of computers is included wherever appropriate. Emphasis is given throughout the course to the development of an understanding of the philosophy of engineering and the decision-making process.

2.5 Credit Hours.

CE 482 Advanced Structural Analysis

Second Term — Prerequisite: CE 401 or CE 451 (ME 384 is recommended).

A continuation of the study of structural analysis (CE 401), mainly in the area of indeterminate structures. Methods of analysis appropriate to both the elastic and plastic theory are studied. Direct integration and numerical approximate analysis such as numerical integration of the beam differential equations and the finite difference method are considered. The displacement matrix method of structural analysis is developed. Independent engineering analysis and design problems which require digital computer application are included to emphasize the practical applications of the concepts studied. *2.5 Credit Hours.*

CE 489 Individual Engineering Projects

Either Term — Prerequisite: Permission of Department.

A course designed to permit the cadet to concentrate in an area of individual interest dealing with a specialized topic in Civil, Weapons Systems, Automotive, Materials, or Management Engineering, or in an Information Processing Seminar. The course is conducted on a small group or individual basis and emphasizes the breadth of the total engineering problem in all its aspects (systems approach), the reasoning process involved in its solution, and the place of the laboratory in its analysis. The scope of the course of study is established by the cadet in consultation with the Course Director. The cadet is required to define and analyze the problem and its parameters, study the fundamentals involved, organize his approach, determine his laboratory procedure, and achieve a solution. *2.5 Credit Hours.*

GE 381 Scientific Management

Either Term — Prerequisite: A subcourse in probability and statistics.

This course is designed to provide an *interdisciplinary* presentation of the fundamental processes and issues of management, unifying the management-related topics presented throughout the total academic program. The course also provides an introduction to the in-depth coverage given by the other electives in the management field. A pragmatic approach will be emphasized by applying the conventional concepts of management theory to obtain practical solutions in realistic management situations. Towards this end, examples will be drawn from industry and the military, the case study technique will be used, and cadets will be exposed to contemporary management literature. *2.5 Credit Hours.*

GE 383 Systems Engineering and Decision Making

Either Term — Prerequisite: Second Class Standing.

The course is designed to acquaint the cadet with the methodology of the systems engineering process and to give him an understanding of the systems approach to engineering problems and to decision making in general. It is an interdisciplinary treatment in the sense that both quantitative and qualitative factors bearing upon a problem are considered. During the course, the cadet is made aware of the various types of values associated with system variables and the problems involved in their analysis. He is also given a brief introduction to certain basic techniques of optimization and decision making. The course is completed with a systems design problem which allows the cadet to apply the fundamental concepts he has studied by the analysis of an existing problem of society requiring an engineering solution. *2.5 Credit Hours.*

OE 383 Engineering Materials

Either Term — Prerequisites: CH 201-202.

This introductory course encompasses a study of the basic principles that govern the physical and mechanical properties of all metals and plastics. This scientific discipline is the basis for predicting the behavior of available materials and designing new material systems to respond in a particular manner under specified environmental conditions for future engineering applications. Course coverage includes crystal and molecular structures, elastic and plastic behavior, material failure in service, methods to enhance material properties, and microscopic analysis of materials. Integrated laboratory experiments analyze the microscopic and macroscopic structures that determine material properties. *2.5 Credit Hours.*

OE 385 Management Engineering

Either Term — Prerequisite: MA 202.

This course provides a comprehensive survey of quantitative methods in management. The purpose is to introduce the analytical approach to command and management problems, develop a facility with certain modern techniques which aid decision making, and improve general managerial abilities. Included in the instruction is a wide range of both deterministic and statistical techniques, with the employment of the computer where practicable, to include: schematic models, engineering programming, inventory control, quality control and systems simulation. The course is pragmatic rather than rigorous and stresses methods currently used to manage military, governmental and industrial organizations. An educational trip to a nearby industrial activity serves to relate classroom material to actual problems. *2.5 Credit Hours.*

OE 481 Automotive Engineering

Either Term — Prerequisites: ME 301, 303 (ME 303 may be taken concurrently).

The course encompasses the analysis and design of internal combustion engines, power trains, suspension systems, and running gear. The course begins with disassembly, assembly, and troubleshooting of malfunctions of a reciprocating engine. Laboratory experiments are conducted to determine the influence of speed, fuel-air ratios, and ignition timing on the performance of engines. The study of power trains includes both manual and automatic transmissions. Handling characteristics of vehicles are predicted from analysis of their suspension systems and the influence of running gear upon tractive effort is shown. The course is concluded by predicting vehicle performance based upon power train design. Also included are details of unconventional propulsion systems under development and future trends in the automotive industry.

2.5 Credit Hours.

OE 483 Helicopter Engineering

Second Term — Prerequisites: ME 302 or ME 352; ME 388.

This course relates helicopter aerodynamic theory to design considerations and decisions. The design of a rotor blade is considered in detail to show how blade type, disc loading, solidity, twist and taper enter into design compromises that are made to meet hover and vertical flight requirements. Available power, desired payload and forward speed relationship are examined and optimized to give maximum performance for forward flight. Helicopter controls are studied and the basics of helicopter stability are introduced. The interaction between helicopter components such as engine, main rotor, tail rotor, control surfaces and fuselage are examined to obtain a total system design. *2.5 Credit Hours.*

OE 487 Operations Research

Either Term.

The Operations Research course develops in considerable depth those quantitative methods which are now well-established and routinely used to analyze managerial-type problems. In addition, it expands on certain quantitative techniques for decision making introduced in OE 385, Management Engineering. The course is initiated with an overview of the techniques of problem solving and modeling. Initially, on the deterministic side of the course, topics presented include: Linear Programming Applications, Competitive Strategies, and Dynamic Programming. Later, probabilistic topics include: Probability and Statistics Review, Inventory Models, Waiting Line Analysis, Simulation Techniques, and Non-Linear programming applications. *2.5 Credit Hours.*

Department of English

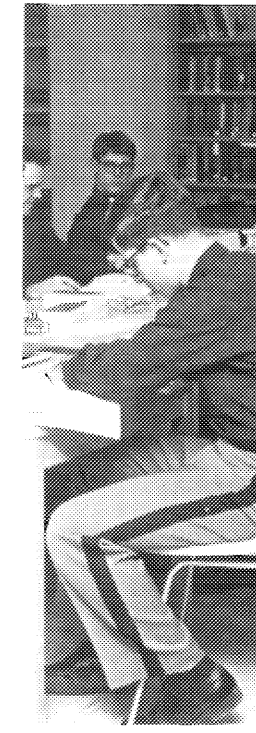
Professor and Head of Department
COL EDWIN V. SUTHERLAND,
B.S., United States Military Academy;
M.A., Columbia University;
Ph.D., University of Pennsylvania; Army War College

Professor and Deputy Head of Department
COL JACK L. CAPPS,
B.S., United States Military Academy;
M.A., Ph.D., University of Pennsylvania

Associate Professors
COL ARTHUR H. BLAIR,
B.S., United States Military Academy;
M.S., California Institute of Technology;
M.A., University of Pennsylvania
LTC LLOYD J. MATTHEWS,
B.S., United States Military Academy;
M.A., Harvard University;
Ph.D., University of Virginia

Assistant Professors
LTC JOSEPH R. CARRAWAY,
B.S., United States Military Academy;
M.A., University of North Carolina
MAJ ARTHUR F. BONDSHU,
B.S., United States Military Academy;
M.A., Columbia University
MAJ WILLIAM R. CALHOUN,
B.S., United States Military Academy;
M.A., University of Pennsylvania
MAJ DONALD A. DE SAPRI,
B.S., United States Military Academy;
M.A., Indiana University
MAJ DEAN E. DOWLING,
B.S., United States Military Academy;
M.A., Columbia University
MAJ HERBERT C. HERTEL, JR.,
B.S., United States Military Academy;
M.A., University of Massachusetts
MAJ DAVID L. MILLER, JR.,
B.S., United States Military Academy
MAJ ALTON D. MORRIS,
B.S., West Texas State College;
M.A., University of Pennsylvania
MAJ JAMES C. PETERSON,
B.S., United States Military Academy;
M.A., University of Pennsylvania
MAJ JERRY M. SOLLINGER,
B.A., University of Pittsburgh;
M.A., University of Pittsburgh
MAJ LOUIS J. STURBOIS, III,
B.S., United States Military Academy;
M.A., Indiana University
MAJ ROBERT A. VOGEL,
B.S., United States Military Academy;
M.A., Cornell University
MAJ ERNEST L. WEBB,
B.S., United States Military Academy;
M.A., Columbia University
MAJ JOHN P. YEAGLEY,
B.S., United States Military Academy;
M.A., University of Massachusetts
CPT ARTHUR M. KELLY, JR.,
B.S., United States Military Academy;
M.A., Columbia University
CPT FRANCIS M. LAZARUS,
B.A., Canisius College;
M.A., Ph.D., Cornell University

Instructors
LTC HERMAN V. IVEY,
B.S., United States Military Academy;
M.A., Columbia University
MAJ CREIGHTON W. ABRAMS, JR.,
B.A., Princeton University;
M.A., University of North Carolina



MAJ MICHAEL B. GEARY,
B.S., St. Norbert College;
M.A., University of Arizona
MAJ TIMOTHY J. GROGAN,
B.S., United States Military Academy;
M.A., Columbia University
MAJ DUANE G. HAACK,
B.S., Iowa State University;
M.A., University of Wisconsin
MAJ ANTHONY E. HARTLE,
B.S., United States Military Academy;
M.A., Duke University
MAJ JOHN W. O'NEAL,
B.S., United States Military Academy;
M.A., University of Pennsylvania
MAJ KENNETH L. TEEL,
B.A., University of Oklahoma;
M.A., Indiana University
MAJ ROBERT E. WHELAN,
A.B., Bowdoin College,
M.A., University of Massachusetts
CPT WILLIAM B. BACHMAN, JR.,
B.S., United States Military Academy;
M.A., University of Syracuse
CPT JOHN D. BERGEN,
B.S., United States Military Academy;
M.A., University of Indiana
CPT WILLIAM S. BIRDSEYE,
B.S., United States Military Academy;
M.A., University of Pennsylvania
CPT DAVID A. BRAMLETT,
B.S., United States Military Academy;
M.A., Duke University
CPT CHARLES R. ECKART,
B.S., United States Military Academy;
M.A., Indiana University
CPT GEORGE O. HILLARD, III,
B.S., United States Military Academy;
M.A., University of North Carolina
CPT EARL R. KELTON,
B.S., United States Military Academy;
M.A., University of Arizona
CPT JOHN K. LYONS,
B.S., United States Military Academy;
M.A., University of Pennsylvania
CPT CRAIG C. MAC NAB,
B.A., Ithaca College;
M.A., University of North Carolina
CPT WILLIAM A. MC INTOSH,
A.B., College of William and Mary;
M.A., University of Virginia
CPT HARRY J. RHINEHART,
B.A., Western Carolina College;
M.A., Western Carolina University
CPT DANIEL M. SMITH,
B.S., United States Military Academy;
M.A., Cornell University
CPT JOHN K. SWENSSON,
B.S., United States Military Academy;
M.A., University of Virginia
CPT JAMES E. VAN SICKLE,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
CPT GEORGE B. VONDRUSKA,
B.S., United States Military Academy;
M.A., University of Massachusetts
CPT KELLY G. WEEMS, JR.,
B.A., University of Mississippi;
M.A., Indiana University
CPT EDWARD D. WINSTEAD,
B.S., United States Military Academy;
M.A., University of North Carolina
2LT JOHNNY E. TOLLIVER,
B.A., Jackson State College;
M.A., Harvard University

STANDARD COURSES

EN 101 Communication Skills: Logic and English Exposition

First Term — Prerequisites: None.

This course is a standard first-semester course in rhetoric and logic with emphasis on the argumentative theme. It stresses the integration of the basic skills needed to evaluate evidence, reach a sound conclusion, and then propound that conclusion, or thesis, in a well-organized theme.

2.5 Credit Hours.

EN 102 Communication Skills: Logic and English Exposition

Second Term — Prerequisites: EN 101 or EN 151.

This course provides for the continued application of skills developed in EN 101 to a variety of writing situations, a series of public-speaking requirements, and an introductory study of the major forms of imaginative literature.

2.5 Credit Hours.

EN 201 Comparative Literature

This course acquaints cadets with the major literary figures of Western civilization and reinforces their awareness of the qualities of enduring imaginative literature and its role in enhancing understanding of human nature. The cadet continues to improve writing skill by preparing several themes on literary topics, including one substantial research theme; and he practices effective speaking by participating in classroom discussion of the readings. Among the authors included are Homer, Dante, Shakespeare, Cervantes, Moliere, Ibsen, and Tolstoy. *2.5 Credit Hours.*

EN 402 Readings in Philosophy: Inquiries into Ethical, Aesthetic, and Spiritual Values

Within a broad context of philosophical inquiry, this course focuses on human values — ethical, aesthetic, spiritual — as they have evolved in man's quest for viable accommodation with life's uncertainties. Readings include expository essays, philosophic discourse, and imaginative literature, ranging among such authors as Plato, Aquinas, Kant and Camus. Continuing emphasis is placed upon development of oral and written expression.

2.5 Credit Hours.

ADVANCED COURSES

EN 151 American Thought and Literature to 1860

First Term — Prerequisites: Selection by Department.

A Fourth Class interdisciplinary course in American Studies, this course examines American religious, political, and social thought, and the aesthetic ideas and cultural criticisms of several writers who have scrutinized American society. Among the authors studied are Taylor, Woolman, Edwards, Franklin, Jefferson, Cooper, Emerson, Thoreau, Hawthorne, Poe, and Melville.

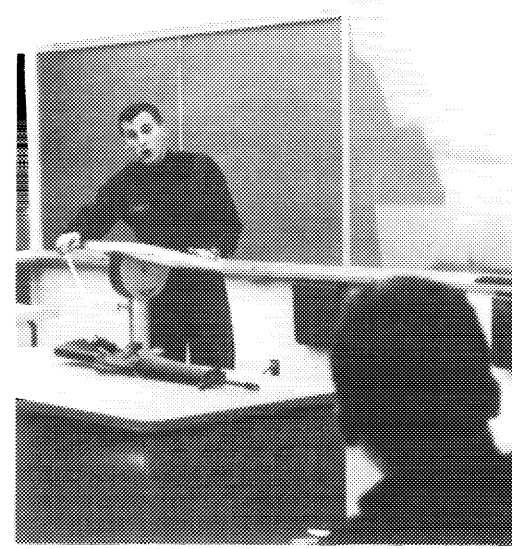
2.5 Credit Hours.

EN 152 American Thought and Literature since 1860

Second Term — Prerequisites: EN 151 or EN 101

A continuation of EN 151, this course focuses on the development and ideas of recent American thought and literature. Among the authors studied are Whitman, Twain, Howells, Dreiser, Adams, Crane, Sandburg, Eliot, Wright, Fitzgerald, O'Neill, Hemingway, Miller, Albee, and Bellow.

2.5 Credit Hours.



ELECTIVE COURSES

EN 381 English Literature from the Beginnings to 1660

Prerequisite: Credit for EN 201.

Cadets in this course read and discuss significant works from Old English, Middle English, and the Renaissance. In doing so, they are introduced to the genesis of various forms of prose, poetry, and drama in English, to the continuity and trends in these forms, and to major authors. The course includes writing requirements designed to focus the student's study on the period under consideration and a written final examination that requires overall knowledge of English literature prior to the Restoration.

2.5 Credit Hours.

EN 382 English Literature from 1660 to 1900

Prerequisite: Credit for EN 201.

This course examines poetry, commentary, and fiction from early Romantics, through the Victorian period to the early 20th century. Students consider the style and content of each selection, toward the end of determining the author's contribution to the body of English literature and the culture of modern America. Among the writers included are Blake. Wordsworth, Keats. Lamb, Arnold, Carlyle, Mill, Ruskin, Hopkins and Austen. *2.5 Credit Hours.*

EN 383 Contemporary Literature

Credit for EN 201.

This course examines contemporary western man and his world, seeking to define the modern temper as seen in major works of fiction, poetry, and drama written since 1880. Among the American and European authors studied are Conrad, Hardy, Yeats, Eliot, Auden, Ibsen, Chekhov, Shaw, Strindberg, Pirandello, and Brecht.

2.5 Credit Hours.

EN 384 American Literature of the Nineteenth Century

Prerequisite: Credit for EN 201

This course examines the works of nine major 19th century American writers: Emerson, Thoreau, Poe, Hawthorne, Melville, Whitman, Twain, James, and Dickinson. The course takes a unified overview, stressing the influence of one writer upon another and the temper of a young nation on all nine. *2.5 Credit Hours.*

EN 391 Introduction to Fine Arts

Overload Elective.

This is a survey course to acquaint the cadet with dominant themes in the visual arts, from primitive cultures, Eastern and Western, to the present. It relates aspects of today's environment — such as architectural, engineering and automotive design, and photography and television graphics — to the history and meaning of art of the past. Visiting professionals give demonstrations of techniques of painting, sculpture, and design, amplified by discussions of current ideas in the art world.

2 Credit Hours.

EN 392 Introduction to Music

Overload Elective.

Not a history of music, per se, this is a practical introduction upon which the cadet can expand his appreciation according to his own interests and talents. Elements of music, the creative process, musical texture and structure are discussed. *2 Credit Hours.*

EN 481 The Novel

Prerequisite: Credit for EN 201.

This course is a study of the development of the novel as a mode of literary expression. The course is devoted to a close reading and analysis of approximately ten representative novels of America and Europe. *2.5 Credit Hours.*

EN 482 Shakespeare

Prerequisite: Credit for EN 201.

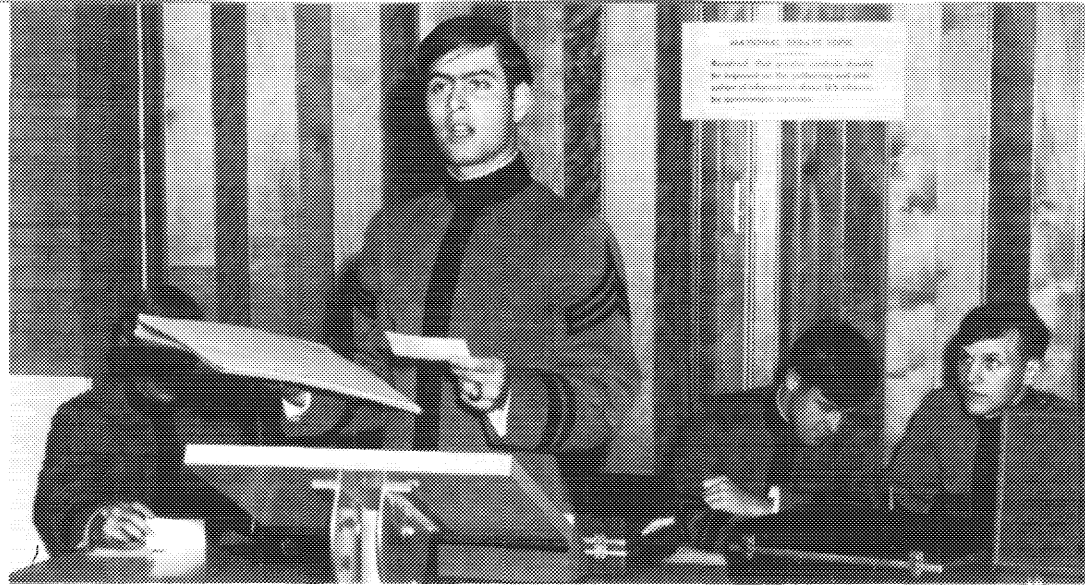
This course consists of a study of the works of Shakespeare both in their historical context and as works of creative imagination. The course stresses the universality of theme, the relation of the writings to Renaissance literature and the temper of the Elizabethan age, and the distinctive character of Shakespeare's genius.

2.5 Credit Hours.

EN 483 Aspects of American Culture

Prerequisites: Credit for EN 201 and HI 203-204.

Each offering of this course permits cadets to study in depth some particular phase, movement, school or theme within American culture. The interdisciplinary emphasis provides a deeper



understanding of the historical evolvement as well as current state of American technological, political, intellectual, and moral thinking. The specific scope of the offerings is determined yearly, but some possibilities include Religious Thought and the American Mind, The Influence of Scientific Thought and Technology on American Life, The Black American in U.S. History, The Westward Expansion, The Mind of the South, Social Issues of the 1920's and 30's, and similar subjects. *2.5 Credit Hours.*

EN 485 Seminar in Major British Authors

Prerequisites: EN 201 and EN 381 or EN 382.

This course permits cadets to study in depth the works of two or three major British authors. Heavy emphasis will be placed on individual student research and reading. *2.5 Credit Hours.*

EN 486 Seminar in Major American Authors

Prerequisites: EN 201 and EN 384.

This course permits cadets to study in depth the works of two or three selected American authors. Heavy emphasis will be placed on individual research and reading. *2.5 Credit Hours.*

EN 487 American Studies: Expositors of 19th Century Thought

Credit for EN 201.

This course is an interdisciplinary study of the attitudes and outlooks of recognized leaders of America's intellectual development in the formative years from the Federalist Period to 1900. Individuals studied include Channing, Jefferson, Emerson, Cooper, Bancroft, W. G. Sumner, William James, et al. *2.5 Credit Hours.*

EN 488 American Studies: Social Criticism in Modern American Writing

Prerequisite: Credit for EN 201.

This course emphasizes not only the developing cultural criticism implicit in the 20th century American novel, but gives equal attention to the relation of these writings to the views expounded by influential artistic, literary, and social critics of the day. *2.5 Credit Hours.*

EN 489 Honors Course

Either Term—Prerequisites: Selection by Department

This course permits the cadet of advanced competency in Literature or American Studies to pursue independent study. With his faculty advisor he develops a project and then conducts extensive research, the findings of which are normally presented in a monograph.

2.5 Credit Hours.

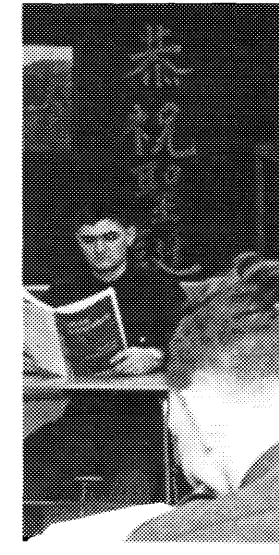
Department of Foreign Languages

Professor and Head of Department
COL WALTER J. RENFROE, JR.,
B.S., United States Military Academy;
M.A., Ph.D., Columbia University; Armed Forces Staff College

Professor and Deputy Head of Department
COL SUMNER WILLARD,
B.A., M.A., Ph.D., Harvard University

Associate Professors
COL JAMES R. ROSS,
B.A., University of California, Berkeley;
M.A., Seton Hall University
LTC HARRY E. CARTLAND,
B.G.E., University of Omaha;
M.A., Middlebury College
LTC GERALD RICHARDSON,
B.S., United States Military Academy;
M.A., Middlebury College

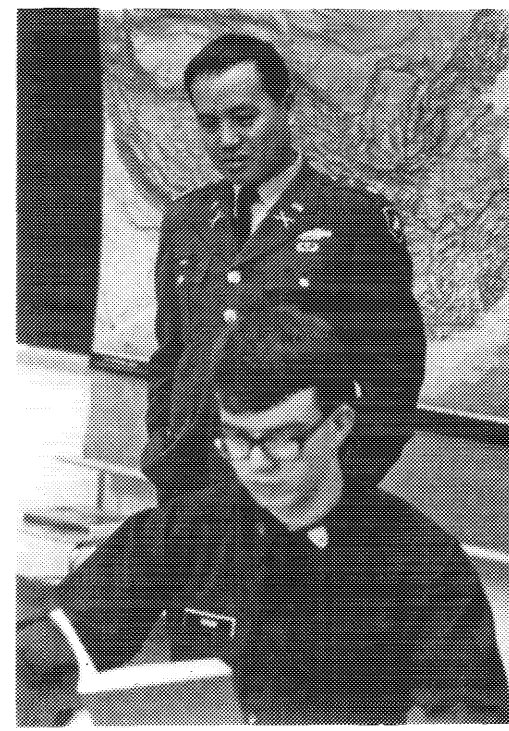
Assistant Professors
COL ALFONSO MARTINEZ-CALDERON,
B.S., Heroico Colegio Militar, Mexico
LTC GENE N. CHOMKO,
B.S., University of Maryland
LTC HANS GIERSCHIK,
M.A., University of Frankfurt, Germany
LTC LAWRENCE H. HALL,
B.S., Marquette University;
M.A., Indiana University;
M.A., University of Richmond
LTC ROBERT HANNAS,
B.A., City College of New York;
M.A., Monterey Institute of Foreign Studies
LTC ROBERTO N. MENDES,
B.S., Academia Militar das Agulhas Negras, Brazil
MR. JASON CHANG,
B.A., National South West Associated University (Kunming, China);
M.A., New York University
MAJ ALDEN M. CUNNINGHAM,
B.S., United States Military Academy;
M.A., Middlebury College
MAJ ROBERT L. DOHERTY,
B.A., Northwestern University;
B.A., University of Maryland;
M.A., Middlebury College
DR. FREDERICK C. H. GARCIA,
B.A. and Licenciado, Federal District University of Rio de Janeiro, Brazil;
Ph.D., New York University
MAJ JOSEPH J. HEINLEIN,
B.A., Duquesne University;
M.A., American University
MAJ DONALD D. INGRAM,
B.S., United States Military Academy;
M.A., Teachers College, Columbia University
MAJ WALTER E. KATUZNY,
B.A., De Paul University;
M.A., Middlebury College
MAJ CRAIG W. NICKISCH,
B.S., South Dakota State College;
M.A., Northwestern University
MR. ARTHUR F. REETZ,
B.A., Friedrich Wilhelm University;
M.A., University of Colorado
MR. SAMUEL G. SALDIVAR,
B.A., M.A., Florida State University
MR. MICHAEL SOLO,
B.A., Monmouth College;
M.A., Fordham University
MR. CLAUDE VIOLLET,
B.A., University of Paris (Sorbonne);
M.A., Middlebury College



CPT WILL E. DeMARET,
B.S., United States Military Academy;
M.A., Middlebury College
CPT JOHANNES W. VAZULIK,
B.A., University of Utah;
M.A., Case Western Reserve University

Instructors

LTC ERIC F. REICHELT,
B.A., University of Nebraska;
M.A., American University
MAJ LLOYD T. ASBURY,
B.S., United States Military Academy
M.A., Middlebury College
MAJ GEORGE A. BOMBEL,
B.S., University of Arizona;
M.A., Middlebury College
MAJ MICHAEL J. CUNNINGHAM
B.S., United States Military Academy;
M.A., Middlebury College
MAJ RICHARD P. GUTHRIE,
B.S., United States Military Academy;
M.A., Middlebury College
MAJ EDWARD A. HAMILTON,
B.S., United States Military Academy;
M.A., University of Pennsylvania
MAJ JOSEPH J. JAWOROWSKI, JR.,
B.S., United States Military Academy;
M.A., Monterey Institute of Foreign Studies
MAJ RICHARD S. KOSEVICH,
B.S., United States Military Academy;
M.A., Indiana University
MAJ PHILEMON A. ST. AMANT II.,
B.S., United States Military Academy;
M.A., Middlebury College
MAJ ANDREA A. SARZANINI,
B.S., United States Military Academy;
M.A., Middlebury College
CPT LARRY L. BEDELL,
B.S., United States Military Academy;
M.A., Middlebury College
CPT LASZLO J. BOESZE,
B.S., Loyola University
CPT PETER M. CECERE,
B.S., United States Military Academy;
M.A., Indiana University
CPT RICHARD J. CONOBOY,
B.A., John Carroll University;
M.A., Middlebury College
CPT THOMAS J. DURFEE,
B.S., United States Military Academy;
M.A., Vanderbilt University
CPT HEINZ FIEBIG,
B.A., University of Nebraska;
M.A., Middlebury College
CPT NORMAN W. GILL,
B.S., United States Military Academy;
M.A., Middlebury College
CPT HARRY C. HAINES III,
B.S., United States Military Academy;
M.A., Middlebury College
CPT JAMES R. HOLBROOK,
B.A. and M.A., American University;
Ph.D., Georgetown University
CPT WILLIAM L. JACKMAN,
B.S., United States Military Academy;
M.A., Vanderbilt University
CPT ARTHUR G. LOZEAU,
B.S., United States Military Academy;
M.A., Middlebury College
CPT EDWARD V. MOORE,
B.S., United States Military Academy;
M.A., Middlebury College
CPT JOHN F. MURRAY,
B.S., United States Military Academy;
M.A., Middlebury College
CPT ROBERT J. OLSON,
B.A., University of Omaha;
M.A., Middlebury College



CPT PETER B. PIAZZA,
B.A., Harvard University
CPT KARL D. SAKAS,
B.S., United States Military Academy;
M.A., Middlebury College
CPT PETER G. SCHMEELK,
B.S., United States Military Academy;
M.A., Middlebury College
CPT CHRISTIAN M. SHORE,
B.S., United States Military Academy;
M.A., Middlebury College
CPT JOHN C. THOMPSON,
B.S., United States Military Academy;
M.A., Middlebury College
CPT DOUGLAS S. THORNBLOM,
B.S., United States Military Academy;
M.A., Middlebury College
CPT DONALD F. ULLMANN,
B.S., United States Military Academy;
M.A., Middlebury College
1LT JAMES M. DUNN,
M.A., University of Notre Dame;
M.A., Ph.D., University of Michigan

STANDARD COURSES

LC 101-102-Chinese; LF 101-102-French; LG 101-102-German; LP 101-102-Portuguese; LR 101-102-Russian; LS 101-102-Spanish

Prerequisites: None.

A basic course in the language. In keeping with the primary objectives of speaking and understanding, oral work is stressed. Audio-lingual skills are developed by reading aloud, repetition drills, question and answer exercises, prepared and extemporaneous dialogues, individual short talks, and frequent use of the language laboratory. After the first month of the course, classroom work is normally in the foreign language.

5 Credit Hours. (2.5 each term)

LC 201-202-Chinese; LF 201-202-French; LG 201-202-German; LP 201-202-Portuguese; LR 201-202-Russian; LS 201-202-Spanish

Prerequisites: The 101-102 courses in the appropriate language.

A continuation of the 101-102 courses, with increased emphasis on applied grammar through discussions, dialogues, individual talks and frequent aural comprehension exercises. Periodic themes are used in conjunction with reading and discussion of several literary works and of historical, geographical, and military material of current interest. Lectures are included on the history and civilization of the people whose language is being studied. All work is conducted in the foreign language.

7 Credit Hours. (3.5 each term)

ADVANCED COURSES

LF 141-142-French; LG 141-142-German; LR 141-142-Russian; LS 141-142-Spanish

Prerequisites: 1 or 2 years of previous study of the language, and proficiency as shown in placement test.

An intermediate course with oral-aural emphasis and a thorough grammar review. Audio-lingual skills are developed by use of pattern drills, question and answer exercises, dialogues, and individual talks. Texts of literary value are read and discussed in class. All classroom work is in the foreign language.

5 Credit Hours. (2.5 each term)

LF 151-152-French; LG 151-152-German; LR 151-152-Russian; LS 151-152-Spanish

Prerequisites: Two or more years of previous study of the language, and proficiency based on oral and written tests administered prior to the beginning of Fourth Class year.

An upper intermediate course, with intensive grammar review and aural-oral emphasis. Extensive use is made of pattern drills, question and answer exercises, dialogues, individual talks, and periodic themes. Reading and discussion of several works of drama and fiction by prominent writers. All classroom work is in the foreign language. *5 Credit Hours. (2.5 each term)*

LF 241-242-French; LG 241-242-German; LR 241-242-Russian; LS 241-242-Spanish

Prerequisites: Completion of the 141-142 courses.

A continuation of the 141-142 courses, with increased emphasis on grammatical and syntactical accuracy, both in speech and writing. Reading of selected modern works, to include some writings on military subjects. Periodic themes are written, and cadets attend five or six lectures on various

cultural aspects of the people whose language is being studied. All classroom work is in the foreign language. *7 Credit Hours. (3.5 each term)*

LF 251-252-French; LG 251-252-German; LR 251-252-Russian; LS 251-252-Spanish
Prerequisites: The 151-152 courses in the corresponding language.
Increased use of audio-lingual techniques, talks, debates, and interpreter exercises. Reading in a wider field of literature. Greater emphasis upon the culture and history of the countries concerned, including several lectures. Some reading of military writings. All classroom work is in the foreign language. *7 Credit Hours. (3.5 each term)*

ELECTIVE COURSES

LF 381 French Language Through Literature
LG 381 German Language Through Literature
LP 381 Portuguese Language Through Literature
LS 381 Spanish Language Through Literature
First Term—Prerequisites: The 201-202 or 241-242 courses in the corresponding languages.
(Not open to cadets who have completed the applicable 251-252 courses.)
Readings in literary works by French, German, Brazilian, Spanish, or South American writers. Class discussions, oral and written reports, all in the appropriate foreign language.
2.5 Credit Hours.

LR 381 Advanced Russian Language
First Term—Prerequisite: LR 201-202.
A continuation of LR 201-202, with increased emphasis on the contemporary forms of spoken Russian and on the acquisition of a broad, general vocabulary. *2.5 Credit Hours.*

LF 382 Military and Scientific Readings In French
LG 382 Military and Scientific Readings In German
Second Term—Prerequisites: The 201-202 or 241-242 or 381 courses in the corresponding language.
Military and scientific readings. Class discussions, themes, and translation into and from the foreign language. *2.5 Credit Hours.*

LP 382 Survey of Brazilian Literature
LR 382 Russian Language Through Literature
Second Term—Prerequisites: The appropriate 381 course, plus demonstrated ability to use the language in more complex situations.
Studies in the history and literature of respective countries. Class discussions, comparative studies, oral and written presentation of material, all in the appropriate foreign language.
2.5 Credit Hours.

LS 382 Military Readings in Spanish
Second Term—Prerequisites: LS 381 or LS 241-242 or validation.
Military readings. Class discussions, themes, oral and written reports, classroom tactical exercises.
2.5 Credit Hours.

LC 383 Chinese Literature and Culture
First Term—Prerequisite: LC 202.
This course utilizes essays on China's culture and civilization and contemporary Chinese writings to increase the student's proficiency in the language. Increased stress is placed on individual talks, writing, group discussions and the development of rapid character reading skill.
2.5 Credit Hours.

LC 384 Chinese Literature and Culture II
Second Term—Prerequisite: LC 383.
Continuation of LC 383. *2.5 Credit Hours.*

LP 383 Military Readings in Portuguese
First and Second Terms—Prerequisites: LP 381.
Military Readings. Class discussions, themes, translations into and from Portuguese.
2.5 Credit Hours.

LF 483 History of French Civilization I
First Term—Prerequisites: LF 251-252 or LF 381-382 or LF 241-242 (upper half) courses.
This course comprises readings in a variety of fields—historical, sociological, cultural, and literary—with the objective of presenting a panorama of French culture in the framework of French history and literary achievement.
2.5 Credit Hours.

LF 484 History of French Civilization II
Second Term—Prerequisites: LF 251-252 or LF 381-383 or LF 241-242 (upper half).
Continuation of LF 483. *2.5 Credit Hours.*

LG 483 History of German Civilization
First Term—Prerequisite: LG 382 or LG 252.
This course, a comprehensive survey, is an integrated study of the geography, history, and cul-

ture of Germany, introducing the cadet to the most significant political, social, economic, and artistic events of each period in the country's growth and development. Emphasis is placed on the German contributions to Western Civilization. Classroom work is in the foreign language. *2.5 Credit Hours.*

LG 484 Contemporary Germany

Second Term—Prerequisite: LG 382 or LG 252.

This course is a detailed study of contemporary Germany, introducing the cadet to the political, social, economic, and artistic events since the end of World War II. Emphasis is placed on Germany's national problems and on her contribution to the Western community of nations, to the Common Market, and to NATO. Classroom work is in the foreign language. *2.5 Credit Hours.*

LR 473 Russian and Soviet Civilization

First Term — Prerequisites: LR 251-252 or LR 381-382.

A greater proficiency in the language is acquired through a survey of the historical and cultural

elements that have developed the USSR and the Russian people. Classroom work is in the foreign language. *2.5 Credit Hours.*

LR 475 Military and Scientific Russian
First Term — Prerequisites: LR 251-252 or LR 381-382.
Intensive readings in scientific and military works to prepare the student to read and understand current Russian publications on these subjects. *2.5 Credit Hours.*

LS 483 Survey of Spanish-American Literature
First Term — Prerequisites: LS 251-252 or LS 381-382 or LS 241-242 (upper quarter).
A study of some of the outstanding modern authors of Spanish-American literature. The development and transformation of existing literary genres; new literary forms; Hispanic-American literature as a mirror of history and society of the nations involved. Classroom work is in the foreign language. *2.5 Credit Hours.*

LS 484 Modern Spanish-American Literature
Second Term — Prerequisites: LS 251-252 or LS 381-382 or LS 241-242 (upper quarter).
Continuation of LS 483 — Survey of Spanish-American literature. *2.5 Credit Hours.*

LC 485 Readings in Modern Chinese
First Term — Prerequisite: LC 384.
This course utilizes articles on a variety of subjects taken from books, magazines, and political treatises, to increase the cadet's skill in speaking, reading, and writing. *2.5 Credit Hours.*

LF 485 Survey of French Literature
LG 485 Survey of German Literature
LS 485 Survey of Spanish Literature
First Term — Prerequisites: The appropriate 251-252 or 381-382 courses.
A survey course of the literature of France, Germany or Spain. Class discussions, themes, outside reading, reports in the appropriate foreign language. *2.5 Credit Hours.*

LC 486 Military Readings in Chinese
Second Term — Prerequisite: LC 202.
Military readings. Class discussions, themes, translations into and from the foreign language, interpreter exercises. *2.5 Credit Hours.*

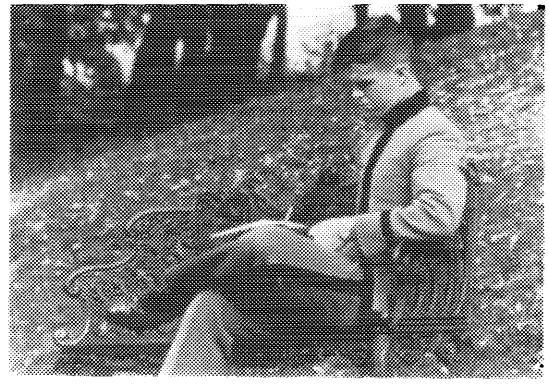
LF 486 Modern French Literature
LG 486 Modern German Literature
LS 486 Modern Spanish Literature
Second Term — Prerequisites: The appropriate 251-252 or 381-382 courses.
Advanced studies in the contemporary literature of France, Germany, and Spain, with class discussions, themes, etc., in the appropriate foreign language. *2.5 Credit Hours.*

LP 485 Directed Studies in Portuguese
LF 487 Directed Studies in French
LG 487 Directed Studies in German
LS 487 Directed Studies in Spanish
First Term — Prerequisites: LP 381 or LF 485-486 or LG 485-486 or two semesters of LS 400 series courses.
These courses are intended for those cadets who have a demonstrated language ability and a strong personal desire to accomplish a more detailed study of a particular period of history or literature. All work will be done in the foreign language. *2.5 Credit Hours.*

LP 486 Directed Studies in Portuguese
LF 488 Directed Studies in French
LG 488 Directed Studies in German
LS 488 Directed Studies in Spanish
Second Term — Prerequisites: LF 487 or LP 381-382 or LG 487 or LS 487.
Continuation of LP 485, LF 487, LG 487, LS 487 — Directed Studies in Portuguese, French, German, or Spanish. *2.5 Credit Hours.*

LR 474 Soviet Russian Literature
Second Term — Prerequisites: LR 252 or LR 382 or LR 473 or LR 475.
A course on the literature of Soviet Russia. Class discussions, talks, outside reading in Russian. *2.5 Credit Hours.*

LR 476 Soviet Expository Writing
Second Term — Prerequisites: LR 473 or LR 475.
Advanced studies based on readings from Soviet publications, class discussion, talks, outside reading in Russian. *2.5 Credit Hours.*



Department of History

Professor and Head of Department
COL THOMAS E. GRIESS,
B.S., United States Military Academy;
M.S., University of Illinois;
Ph.D., Duke University

Professor and Deputy Head of Department
COL ROGER H. NYE,
B.S., United States Military Academy;
M.P.A., Princeton University;
Ph.D., Columbia University

Visiting Professor in Military History
JAY LUVAAS,
A.B., Allegheny College;
M.A., Ph.D., Duke University

Associate Professors
LTC DOUGLAS M. CRAVER,
B.S., Gettysburg College;
M.A., Duke University
MAJ STEPHEN KLEIN,
B.S., United States Military Academy;
M.A., Syracuse University
MAJ MOORAD MOORADIAN,
Ed.B., Rhode Island College;
M.A., University of Rhode Island

Assistant Professors
LTC JOSEPH H. BEASLEY,
B.A., University of North Carolina;
M.S.T., Duke University;
Ph.D. (Candidate), University of Chicago
LTC JOHN H. BRADLEY,
B.S., United States Military Academy;
M.A., Rice University
LTC RICHARD L. CURL,
B.S., United States Military Academy;
M.S.C.E., University of Illinois
LTC DAVID R. METS, USAF,
B.S., United States Naval Academy;
M.A., Columbia University
CDR JEROME A. O'CONNELL, USN,
B.S., United States Naval Academy
B.S., United States Naval Academy;
LTC EDWARD H. TUREK, USAF,
B.S., Utah State
MAJ ALONZO L. COOSE, JR.,
B.S., United States Military Academy;
M.A., Duke University
MAJ JACK W. DICE,
B.S., United States Military Academy;
M.A., Duke University
MAJ JAMES K. EVETTS, JR.
B.S., United States Military Academy;
M.A., Duke University
MAJ EDWARD S. FOSTER, JR.,
B.A., Norwich University;
M.A., University of Southern California
MAJ DAVID M. GLANTZ,
B.A., Virginia Military Institute;
M.A., University of North Carolina
MAJ JOHN A. HIXON,
B.S., United States Military Academy;
M.A., Rice University
MAJ DON L. LAIR,
B.S., United States Military Academy;
M.A., Stanford University
MAJ HAROLD W. NELSON,
B.S., United States Military Academy;
M.A., University of Michigan
MAJ JIM R. PASCHALL,
B.S., United States Military Academy;
M.A., Duke University
MAJ ALEXANDER P. SHINE,
B.S., United States Military Academy;
M.A., Harvard University

MAJ KENNETH A. STEADMAN,
B.A., University of Dayton, Ohio;
M.A., Johns Hopkins University
MAJ JOHN F. VOTAW,
B.S., United States Military Academy;
M.A., University of California, Davis
MAJ DONALD L. WILLIAMSON,
B.S., United States Military Academy;
M.A., University of Hawaii
CPT. MICHAEL D. KRAUSE,
B.A., Norwich University;
M.A., Ph.D., Georgetown University
CPT HENRY J. LOWE,
B.S., United States Military Academy;
M.A., University of Virginia
CPT ROY L. MAY,
B.A., M.A., Texas A&M University
CPT CHARLES R. SHRADER,
B.A., Vanderbilt University;
M.A., Columbia University
CPT EGON R. TAUSCH,
B.A., M.A., University of Texas

Instructors

LTC JAMES B. AGNEW,
A.B., The Citadel;
M.P.A., Princeton University
LTC VINCENT P. McDONALD,
B.A., Providence College;
M.B.A., Ohio State University;
M.A., University of Missouri
MAJ DAVID A. ARMSTRONG,
B.S., United States Military Academy;
M.A., Duke University
MAJ THEODORE J. CRACKEL, JR.,
A.B., University of Illinois;
M.A., Rutgers University
MAJ JAMES S. DICKEY,
B.S., United States Military Academy;
M.A., Yale University
MAJ CURTIS V. ESPOSITO,
B.S., United States Military Academy;
M.A., Duke University
MAJ WILLIAM R. GRIFFITHS,
B.S., United States Military Academy;
M.A., Rice University
MAJ HAROLD M. HANNON,
B.S., United States Military Academy;
M.A., Duke University
MAJ DONALD V. LOCKEY,
B.S., United States Military Academy;
M.A., Duke University
MAJ ROGER D. MANNING,
B.S., United States Military Academy;
M.A., Michigan State University
MAJ KENNETH V. SMITH,
B.A., Creighton University;
M.A., University of North Carolina
CPT MARTIN W. ANDRESEN,
B.S., United States Military Academy;
M.A., University of Iowa
CPT ROBERT S. BALLAGH, JR.,
B.S., United States Military Academy;
M.A., Duke University
CPT ROBERT A. DOUGHTY,
B.S., United States Military Academy;
M.A., University of California, Los Angeles
CPT ROBERT T. FRANK,
B.S., United States Military Academy;
M.A., University of California, Los Angeles
CPT WILLIAM N. RITCH, JR.,
B.S., United States Military Academy;
M.A., University of Virginia
CPT DENNIS L. SEILER,
B.S., United States Military Academy;
M.A., Duke University
CPT PIERS M. WOOD,
B.S., United States Military Academy;
M.A., University of Wisconsin

STANDARD COURSES

HI 201 History of Modern Europe, 1500-1815

First Term Prerequisites: None.

A series of problem studies, dealing with medieval society, the Renaissance and Reformation, the Scientific Revolution and Enlightenment, and the development of the modern state. The course is designed to enable each cadet to understand the general nature of the evolution of western man's thought, institutions, and culture; to learn new techniques of historical research, analysis, and writing; and to develop attitudes, insights, and values which comprise a personal philosophy of history. *2.5 Credit Hours.*

HI 202 History of Modern Europe, 1815-1945

Second Term Prerequisites: HI 201 or the equivalent.

A continuation of the first semester, the course is a detailed study of the major problems and developments of the 19th Century, completed by consideration of the two World Wars of the 20th. The central themes stressed are social, political, and intellectual developments, including where appropriate the interrelationships of European and non-European cultures. Using the seminar technique as a vehicle, cadets choose an in-depth study of a particular topic on which they write a research paper. *2.5 Credit Hours.*

HI 203 History of The United States to 1877

First Term Prerequisites: None.

A survey of the major developments in American society from the Age of Discovery to the end of Reconstruction. This course emphasizes the impact of the colonial experience, early national social, political and economic issues, and the Civil War on the evolution of a distinctive American character. *2.5 Credit Hours.*

HI 204 History of The United States since 1877

Second Term Prerequisites: HI 203 or the equivalent.

A survey of the major trends in American society since Reconstruction. Particular stress is laid upon those social, political, and economic developments which have been of continuing influence. The rise of the United States to a position of world power is also emphasized. Selected historical issues are studied in detail, using the seminar technique as a vehicle.

2.5 Credit Hours.

HI 401-402 History of The Military Art

Prerequisites: HI 201-202 or HI 203-204.

Through a study of history from the ancient times to the present, this course examines man in his application of military power and traces the evolution of the art of war. Beginning with the military experiences of the Ancient Greeks, this course explores the entire spectrum of war, emphasizing the development of national armies; the recognition, formulation and application of military theory and doctrine; the impact of technological and industrial developments; the influence of logistics on strategy and tactics; the emergence of global and total wars; the interrelationship of land, sea, and air power and the problems and considerations involved in the organization and function of high commands in joint and combined operations; the growing emphasis on limited war and unconventional warfare; the personalities of outstanding leaders and their contributions to the art of war; the philosophies of important military thinkers and writers; and the impact on war of political, social and economic factors. *7 Credit Hours.*

ADVANCED COURSE

HI 451-452 Advanced History of The Military Art

Prerequisites: HI 201-202 or HI 203-204 and Course Director Approval.

Through a study of history from ancient times to the present, this course examines man in his application of military power and traces the evolution of the art of war. The course is comparable to the standard course (HI 401-402) except that the cadet progresses at a faster rate, is introduced to additional materials, and develops a deeper insight into the nature of war and a more comprehensive understanding of the men who wage it. The course stresses historical analysis and critique and requires more extensive student participation. The cadet participates in debates, may be involved in preparing a term project, and in each term is involved in at least one war game

or similar exercise which acts as a vehicle for developing or verifying military concepts.

7 Credit Hours.

ELECTIVE COURSES

HI 371 History of Russia

Either Term — Prerequisites: HI 201-202 or HI 203-204.

A general survey of the historical development of the Russian nation and its relation to the western world. Three-quarters of the course is devoted to the post-1825 period, utilizing modern approach. Special attention is paid in the Soviet period to the unique role of the Communist Party in Russian politics and the central role of state planning. Recognizable aspects of continuity and change, drawn from the periods before and after the Revolution, are analyzed.

2.5 Credit Hours.

HI 372 History of United States Foreign Relations

Either Term — Prerequisites: HI 201-202 or HI 203-204 (HI 202 or HI 204 may be taken concurrently).

A study of the history of American relations with the world with emphasis on the period since the Spanish-American War. The course also focuses on the role of individuals in the formulation of national policy within the framework established by the Constitution, historical precedents, domestic forces, and external developments. Course objectives include gaining: (1) a knowledge of the nature, origins, and historical development of modern American diplomacy during the evolution of the United States to a position as a world power (2) an understanding of the historical factors involved in the formulation and execution of foreign policy and (3) a basis for examining and evaluating present policies and diplomatic actions of the United States in their proper historical perspective. *2.5 Credit Hours.*

HI 373 Topics in American History

Either Term — Prerequisites: HI 201-202 or HI 203-204 (may not be taken concurrently).

This course offers the cadet a variety of American History topics for in-depth study. Topics customarily differ each semester and are focused on certain periods of the American past or on certain continuing aspects of American life.

2.5 Credit Hours.

1st Term, AY 1972-73: The Progressive Era, 1890-1920.

A study of reform in late 19th and early 20th Century America, which examines the impact of the populist heritage on urban reform; the nature of municipal, state and national reform movements, and the roles of muckrakers and other social critics. Particular attention is given to various political philosophies (The New Nationalism, the New Freedom, and socialism) and to the influence of Progressive thought on foreign policy.

2d Term, AY 1972-73: The American Revolution.

A study of the constitutional, political, social, economic and intellectual developments in 18th Century America. Beginning with the emergence of a national consciousness, the course focuses on the internal and external conflicts of the American Revolution and concludes with the Constitutional Convention of 1787.

HI 374 Topics in European History

Either Term — Prerequisites: HI 201-202 or HI 203-204 (may not be taken concurrently).

This course offers the cadet a variety of European History topics for in-depth study. Topics customarily differ each semester and are focused on certain periods of the Western and European development; national histories are often presented, as are the more topical histories of science, diplomacy, and religion. *2.5 Credit Hours.*

1st Term, AY 1972-73: Germany Since 1870.

A study of the evolution of the Germany of Bismarck to the Germany of the Third Reich, which examines the social, political, and economic strands of this transition against the international background. Special attention is devoted to the major historical figures and the historiography of the period.

2d Term, AY 1972-73: Evolution of the French Nation, 1648-1800.

The basic theme of the course is the development and disintegration of the French body politic under the Bourbon dynasty in the 17th and 18th Centuries. Starting with the reign of Louis XIV, the course traces the major themes of French history as seen in an examination of

French dominance of Enlightenment thought, analysis of the social structure of the *ancien régime*, and consideration of the social, economic, and ideological causes of the French Revolution. The course concludes with a detailed study of the French Revolution and its impact on European society.

HI 381 Revolutionary Warfare

Either Term — Prerequisites: HI 201-202 or HI 203-204 (may be taken concurrently).

A study of the historical evolution of the theory and practice of modern revolutionary warfare. The various causes and forms of modern revolutionary warfare are developed through a series of selected historical case studies, with special attention being given to the unique economic, political, social, and military nature of these struggles. The course focuses on the writings of selected revolutionary theorists and the experiences of certain counter-revolutionary practitioners, and specific emphasis is placed on communist revolutionary theory and practice as well as the impact of and residuals from World War II on the evolution of revolutionary warfare.

2.5 Credit Hours.

HI 383 20th Century Warfare

Either Term — Prerequisites: HI 201-202 or HI 203-204 (may be taken concurrently).

This course combines a study of the military systems of the major powers, their civil-military relations, and the influence of the theorists in order to provide an understanding of the way

wars have been fought in the 20th Century. For World Wars I and II the pre-war military systems of the major belligerents are surveyed, the influence of the pre-war theorists is assessed, and the resulting nature of these wars is discussed. For the post-World War II period, the problems in adjusting to the nuclear age are examined, including analysis of the Korean War (viewed from the standpoints of limited war and American problems in civil-military relations) nuclear and limited war strategy and the current roles of the Army, Navy and Air Force. *2.5 Credit Hours.*

HI 384 Topics in Military History

Either Term — Prerequisites: HI 201-202 or HI 203-204 (may not be taken concurrently).

This course offers the cadet a variety of in-depth topics devoted to the study of military history. The topics, which differ each semester, focus primarily on the broader, non-operational areas of military history. *2.5 Credit Hours.*

1st Term, AY 1972-73: The Development of Sea Power.

Beginning with the Age of Sail, this topic traces the impact of Sea Power on the national strategies of major Western Powers. Although other major powers are studied, particularly in the earlier periods, the growth of US Naval Power in the 19th and 20th Centuries is emphasized.

2d Term, AY 1972-73: The Development of Air Power.

Beginning with World War I, this topic traces the development of the theory, doctrine and employment of air power to the present. Although emphasis is on the United States, the role of air power in the development of military and national strategies of other major powers is investigated.

HI 481 Seminar in History

Either Term — Prerequisites: HI 201-202 or HI 203-204.

A study of theories and methods used in historical analysis of man's developing institutions and ideas. The purposes of the course are: (1) to learn the theories and methods used in historical analysis of man's developing institutions and ideas; (2) to read representative works of eminent historians and thinkers, analyzing their use of sources, interpretive philosophies, and styles; (3) to apply these ideas to an investigation of a suitable historical topic selected from the period of Western history under analysis by the seminar. *2.5 Credit Hours.*

1st Term, AY 1972-73: History of Asian Religions.

The course examines the history of Asian religious expression and thought, focusing on the development of Hinduism, the beginnings of Buddhism, the growth of Taoism and Confucianism in China, the development of Zen and Shinto in Japan, and the spread of Islam to Asia. Particular stress will be placed on "schools" of religious expression such as Hinayana, Mayahana, Pure Land, and Zen Buddhism.

2d Term, AY 1972-73: War and Society: The 19th Century Western Experience.

A study of the relationships between the military and the societies which they serve. Particular emphasis is placed upon the impact of the French and the Industrial Revolutions upon military practices and institutions and the role of the major armies of Western Europe and the United States in resolving domestic and international problems. Reading is concentrated on those areas in European and American history that best illustrate the topics under consideration.

HI 489 Individual History Project

Either Term — Prerequisites: Limited to cadets in the First Class; approval required from the Head of the Department.

An individual research project, this course affords the cadet the opportunity to select an historical topic in consultation with his faculty advisor, and proceed independently with either (1) Guided Reading and Reporting, in which the cadet will study selected books and documents and be evaluated on review examinations and written reports of reading and research or (2) The Research Project, in which the cadet with suitable background in an historical topic investigates and is evaluated upon a comprehensive in-depth research report which he normally defends orally before a faculty committee. The cadet and faculty advisor meet during the term as often as either feels is necessary.

2.5 Credit Hours.

Department of Law

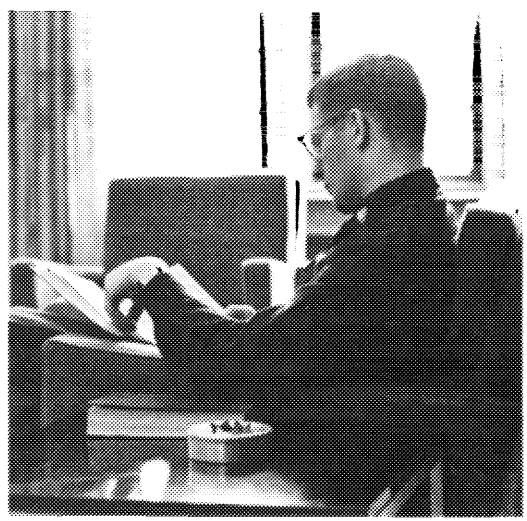
Professor and Head of Department
COL FREDERICK C. LOUGH,
B.S., United States Military Academy;
J.D., Columbia University; Industrial College of the Armed Forces

Associate Professor and Deputy Head of Department
COL THOMAS C. OLDHAM,
J.D., University of Miami;
LL.M., New York University

Associate Professors
MAJ BARRETT S. HAIGHT,
B.S., United States Military Academy;
J.D., Dickinson School of Law
MAJ DANIEL W. SHIMEK,
B.S., United States Military Academy;
J.D., University of Wisconsin

Assistant Professors
CPT JAMES M. BAUSCH,
B.S., Creighton University;
J.D., Creighton University
CPT WILLIAM F. BELCHER,
B.A., University of South Florida;
J.D., Stetson University College of Law
CPT JOHN D. CONDERMAN,
B.A., University of Kansas;
J.D., University of Kansas
CPT EDWIN M. COOPERMAN,
B.A., Queens College of New York;
J.D., Ohio State University
CPT LAWRENCE M. HANDELSMAN,
B.B.A., City College of New York;
J.D., New York University School of Law
CPT JOSEPH M. GRINES,
B.S., Drexel Institute;
J.D., Temple University
CPT THOMAS F. MITCHELL,
B.A., Stanford University;
LL.B., University of Virginia
CPT MICHAEL R. MAGASIN,
B.A., University of California;
J.D., University of California
CPT WILLIAM B. WOODWARD,
B.A., Florence State University;
J.D., Cumberland School of Law

Instructors
MAJ JEROME X. LEWIS,
B.S., United States Military Academy;
J.D., Georgetown University
MAJ EARL A. PAULEY,
B.S., M.B.A., J.D., West Virginia University;
L.L.M., George Washington University
CPT DON D. CARLSON,
B.A., University of Iowa;
J.D., University of Iowa
CPT JOHN F. DEPUE,
A.B., Georgetown University;
J.D., Villanova University
CPT DAVID W. HAYES,
A.B., Northeastern University;
LL.B., Boston University Law School
CPT KEVIN M. RYAN,
B.S., Ohio State University;
J.D., Ohio State University
CPT JAMES N. WILKERSON,
B.A., University of Texas;
LL.B., University of Texas



STANDARD COURSES

LW 301 Introduction to Law and Constitutional Law

First Term — Prerequisites: None.

This course emphasizes a basic introduction to law and a detailed study of Constitutional Law. The introductory phase includes analysis of types of law, principal theories of law, the functions of courts and such traditional legal subjects as contracts, torts, persons and property. The Constitutional Law subcourse provides an examination of the Constitutional concept of the United States government including the legal checks and balances of the three branches of government; legal regulation in a federal system, especially the commerce clause and its limitations; political and civil rights, including freedom of speech, press, assembly and religion, equal protection of the law and discrimination; criminal law procedures; administrative due process; and war powers. *2.5 Credit Hours.*

LW 302 Law for The Military Commander

Second Term — Prerequisites: LW 301.

This standard course includes a study of military criminal law and administrative law and introductory principles of international law. Emphasis is on the law applicable to practical problems the student will encounter as a commissioned officer. The Criminal Law subcourse combines readings and seminars covering concepts of punishment, criminal acts and intent, evidentiary issues involving hearsay, search and seizure and self-incrimination, and the various forums of judicial and nonjudicial punishment. The Administrative Law subcourse permits analysis of a range of subjects relating to the attainment of administrative due process within the military. Topics include delegation of administrative powers, grounds for discharge, administrative responsibility for injury to property or person, and the status of servicemen with respect to civilian laws. Basic principles of international law are discussed in the context of jurisdiction over visiting forces and responsibilities of the soldier pursuant to treaties and the laws of war.

2.5 Credit Hours.

ELECTIVE COURSES

LW 481 International Law

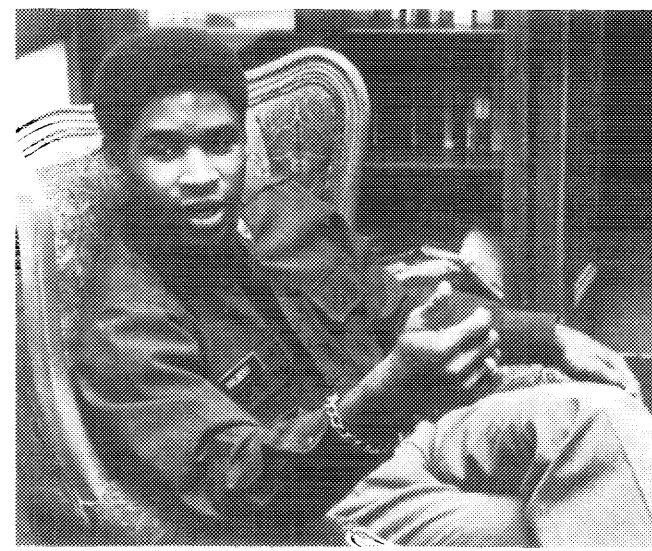
Either Term — Prerequisites: LW 301-302.

The fundamental theories and rules governing the relationships among the states are analyzed in the setting of selected cases and materials. Students gain an appreciation of the nature, sources and applications of international law while discussing legal problems of recognition, jurisdiction, and responsibilities of states; international agreements and diplomatic intercourse; and use of force, including the Geneva Conventions and the laws of war. *2.5 Credit Hours.*

LW 482 Seminar in Military Aspects of International Law

Second Term — Prerequisites: LW 301, 302, and 481.

The course requires class analysis of selected case studies involving significant modern international law episodes, such as the Cuban missile crisis. Class teams study hypothetical problems involving international confrontations on land, sea and air. These problems require research and presentation of solutions applying international law norms. Each cadet researches and reports on a current international problem susceptible of a legal solution. *2.5 Credit Hours.*



Department of Mathematics

Professor and Head of Department
COL JOHN S. B. DICK,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology;
M.S., Rensselaer Polytechnic Institute;
Armed Forces Staff College, NATO Defense College

Professor and Deputy Head of Department
COL JACK M. POLLIN,
B.S., United States Military Academy;
M.S., University of Pennsylvania;
M.S., Rensselaer Polytechnic Institute;
M.A., George Washington University;
Ph.D., University of Arizona;
Army War College

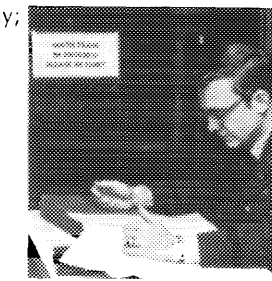
Associate Professors
COL DAVID H. CAMERON,
B.S., United States Military Academy;
M.S.E., M.A., Princeton University;
M.S., Rensselaer Polytechnic Institute;
Ph.D., Princeton University
COL NEIL B. DOWNEY,
B.S., University of Florida;
M.S., Rensselaer Polytechnic Institute;
Armed Forces Staff College
COL THOMAS E. ROGERS,
B.S., United States Military Academy;
B.S., M.A., University of Alabama;
Army War College
LTC JAMES W. McNULTY,
B.S., United States Military Academy;
M.S., Ph.D., University of Ilinois;
Armed Forces Staff College

Assistant Professors
LTC FLETCHER J. BUCKLEY,
B.S., United States Military Academy;
M.S., Stanford University
MAJ THOMAS R. BAXTER,
B.S., Auburn University;
M.S., Stanford University
MAJ QUINTON P. BOYD,
B.S., Davidson College;
M.S., Purdue University
MAJ RICHARD I. CARLSON,
B.S., United States Military Academy;
M.S., Stanford University
MAJ ROBERT J. CASTLEMAN, JR.,
B.S., United States Military Academy;
M.S., United States Naval Postgraduate School
MAJ GARY Q. COE,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ FRANCIS W. FARRELL, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ ALBERT J. GENETTI, JR.
B.S., United States Military Academy;
M.S., University of Illinois
MAJ MONROE B. HARDEN,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ RICHARD E. HELMUTH,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ JAMES R. KANNING,
B.S., University of Texas;
M.S., University of Arizona
MAJ JOSEPH H. LANE,
B.S., United States Naval Academy;
M.S., Stanford University
MAJ ROBERT D. MARCINKOWSKI,
B.S., United States Military Academy;
M.S.E., Purdue University
MAJ BERNARD M. MARTIN,
B.S., United States Military Academy;
M.S., United States Naval Postgraduate School

MAJ DALE F. MEANS,
B.S., United States Military Academy;
M.S.E., Arizona State University
MAJ THOMAS H. ROUSSEAU,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ WALTER R. SHOPE,
B.S., United States Military Academy;
M.S., Stanford University
MAJ GLEN J. THORSON,
B.S., University of Illinois;
M.S., Rensselaer Polytechnic Institute
MAJ ERNEST G. ZENKER,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
CPT MICHAEL R. COOK,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
CPT RONALD W. LIND,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

Instructors

MAJ JEROME R. ANDERSEN,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ BILLY R. ARNOLD,
B.S., Jacksonville State University;
M.S., Rensselaer Polytechnic Institute
MAJ GLEN A. BLUMHARDT,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ JAMES P. CARGILE, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ MICHAEL A. CLAY,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ GEORGE C. DeGRAFF, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ RUDOLPH H. EHRENBERG,
B.S., United States Military Academy;
M.S., Stanford University
MAJ FRED E. GANTZLER, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ DONALD K. GRIFFIN,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ FRED W. HALL, JR.,
B.S., United States Military Academy;
M.S., University of Michigan
MAJ ROBERT T. HOWARD,
B.S., Northeastern University;
M.S., Texas A&M University
MAJ MARTIN M. ISCHINGER,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ RAYMOND L. JENISON,
B.S., United States Military Academy;
M.S., University of Arizona
MAJ JOHN H. MATTHEWS,
B.S., Mississippi State University;
M.S., Georgia Institute of Technology
MAJ DUANE H. MYERS,
B.S., United States Military Academy;
M.S., Purdue University
MAJ JOHN F. NAU, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ WILLIAM A. SCHMIDT,
B.S., Southwest Missouri State College;
M.S., Texas A&M University
MAJ WILLIAM D. SMITH, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ RONALD D. STEINIG,
B.S., United States Military Academy;
M.S., University of Arizona
MAJ CHARLES M. SWAIN,
B.S., United States Military Academy;
M.S., Stanford University
MAJ FRANKLIN T. TILTON,
B.S., United States Military Academy;
M.S., Stanford University
MAJ GARY J. WALK,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ SAMUEL K. WASAFF, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute
MAJ JAMES M. WORTHINGTON,
B.S., United States Military Academy;
M.S., Stanford University
CPT HOWARD F. BACHMAN,
B.S., United States Military Academy;
M.S., Rice University



CPT STEVEN M. BETTNER,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT ARTHUR G. BONIFAS,
B.S., United States Military Academy;
M.S., Syracuse University

CPT TERRY A. CARLSON,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT JOHN R. CARY, JR.,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT ARNOLD H. GAYLOR,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT STEVEN L. HANAU,
B.S., United States Military Academy;
M.S., Stanford University

CPT STEVEN C. HARMAN, JR.
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT KELSO W. HORST,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT WILLIAM W. HOYMAN,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT RUSSELL C. HUNT,
B.A., University of Akron;
M.S., Rensselaer Polytechnic Institute

CPT CRAIG R. HUTCHINSON,
B.S., Colorado School of Mines;
M.A., University of Arizona

CPT WILLIAM J. MAYHEW,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT WALTER L. MURFEE,
B.S., United States Military Academy;
M.S., Tulane University

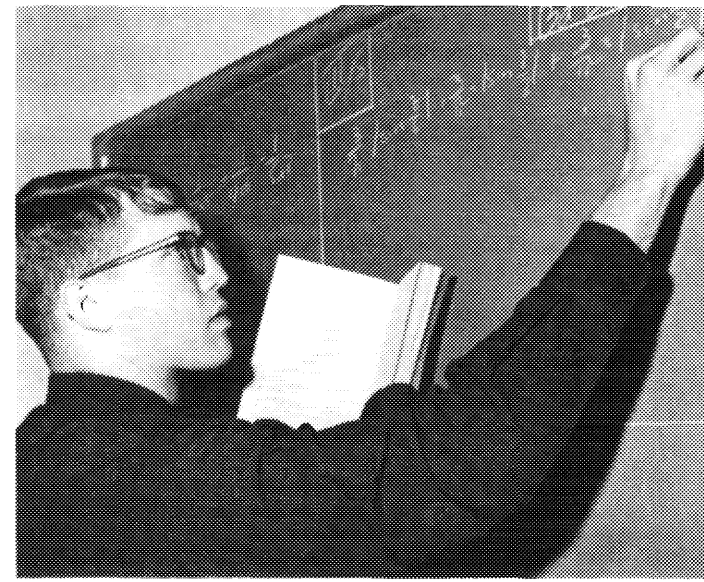
CPT JAMES C. NAVARRA,
B.S., United States Air Force Academy;
M.S., University of California, Los Angeles

CPT WILLIAM E. TRAUBEL,
B.S., United States Military Academy;
M.S., Princeton University

CPT HERBERT J. TREXLER, JR.,
B.S., M.A., Eastern Michigan University

CPT THOMAS R. WHITE,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute

CPT GEORGE T. WOOLSEY,
B.S., United States Military Academy;
M.S., Rensselaer Polytechnic Institute



The general requirement in mathematics for graduation from the Military Academy is satisfied by successful completion of the Standard Program at the end of the second year of study. The three Advanced Programs are designed for cadets who, by virtue of outstanding performance demonstrated during the early months of first year mathematics, exceptional aptitude, or above standard preparation before entering West Point, are able to satisfy the Standard Program requirements in less than two years, thus gaining time for additional elective courses. Cadets in an Advanced Program who are not able to maintain proper progress are transferred to a lower program. Cadets who are permitted to concentrate their elective courses in the National Security and Public Affairs or Humanities (NSPA/HUM) areas may take MA 207 plus one elective or an upperclass core course in lieu of MA 205/206. The courses constituting the Standard and Advanced Programs are summarized below. Electives chosen

by cadets in Advanced Programs during their second year need not be in mathematics, but if mathematics is chosen the recommended courses are those listed.

STANDARD PROGRAM

First year, MA 107-108;
second year, MA 205-206 *21 Credit Hours.*

STANDARD PROGRAM: (NSPA/HUM)

First Year, MA 107-108;
second year, MA 207. *17.5 Credit Hours.*

ADVANCED PROGRAM I

First year, MA 107-158;
second year, MA 201-282 or MA 203-284.
21 Credit Hours.

ADVANCED PROGRAM II

First year, MA 153-154;
second year, MA 281-202. (Class of 1975 or earlier.) *21 Credit Hours.*
First year, MA 153-154;
second year, MA 201-282 or MA 203-284. (Class of 1976.) *21 Credit Hours.*

ADVANCED PROGRAM III

First year, MA 155-156;
second year, MA 285-286 *21 Credit Hours.*

The subject matter content of the individual courses is described in the outlines that follow.

STANDARD PROGRAM COURSES

MA 107 Calculus and Analysis
Prerequisites: None
This is the first term of the two term Standard Program in calculus and plane analytic geometry. It begins with a brief introduction to set theory and inequalities. This is followed by a rigorous treatment of differential and integral calculus of functions of a single variable that is coordinated with plane analytic geometry and appropriate practical applications. *7 Credit Hours.*

MA 108 Calculus and Analysis
Prerequisite: MA 107
This is the second term course in the Standard Program. Study of single variable calculus continues with consideration of transcendental functions, the theory of infinite series and plane vectors. The course concludes with the study of solid analytic geometry, vector calculus and the calculus of functions of several variables. Included are such topics as partial differentiation, multiple integration, vector differentiation, line and surface integrals, and the consideration of Green's, the Divergence and Stokes' Theorems.
7 Credit Hours.

MA 205 Differential Equations, Probability Theory and Statistical Inference
Prerequisite: MA 108 (or MA 106 for Classes prior to 1976).
The differential equations subcourse covers those first order equations for which exact solutions are obtainable, solutions to higher-order linear differential equations with constant coefficients by the method of undetermined coefficients, applications of second order linear equations, and solutions of linear equations with variable coefficients. Methods treated include Laplace transforms, numerical approximations and power series. Fourier series and partial differential equations are introduced. The probability and statistics subcourse includes fundamentals of probability theory, random variables, probability distributions, and probability density functions; binomial, Poisson, and normal distributions and the Central Limit Theorem. *3.5 Credit Hours.*

MA 206 Probability Theory and Statistical Inference, Linear Algebra and Linear Programming
Prerequisite: MA 205
This course includes the last part of Probability and Statistical Inference begun in MA 205 to include sampling distributions; the chi-square and Student-t distributions; confidence intervals for means, proportions and variances; hypothesis testing; correlation and regression analysis. The work in linear algebra includes a study of matrices, determinants, systems of linear equations, vector spaces, characteristic values, vectors, and quadratic forms. It includes an introduction to linear programming which treats the optimal solution of a linear system of the type considered in military applications. *3.5 Credit Hours.*

MA 207 Differential Equations and Probability Theory and Statistical Inference

Prerequisite: MA 108 or MA 154 (or MA 106 for Classes prior to 1976.)

This course is designed for those students who elect NSPA/HUM as their areas of concentration and it meets only the minimum mathematical requirements necessary for graduation. The course includes a basic sub-course in differential equations to include Laplace transforms, power series, and an introduction to Fourier series followed by a subcourse in probability theory and statistical inference. The probability and statistics subcourse includes fundamentals of probability theory, random variables, probability distributions and probability density functions; binomial and normal distributions, the Central Limit Theorem, the chi-square, Student-t, and Poisson distributions, sampling distributions, theory of estimation, confidence intervals and hypothesis testing.

3.5 Credit Hours.

ADVANCED PROGRAM I COURSES

MA 158 Advanced Placement Calculus, Analysis, and Linear Algebra

Prerequisites: MA 107 and selection by Head of Department

This course is given in the second term of the first year to selected cadets who complete MA 107 with high standing and thereby become eligible for Advanced Program I. The course coverage is the same as in MA 108 plus a course in linear algebra with coverage of vector spaces, matrices, determinants, linear transformations, systems of linear equations, and characteristic values.

7 Credit Hours.

MA 201-282 Differential Equations, Differential Equations (Intermediate), and Probability Theory and Statistical Inference

Prerequisite: MA 158

The first one third of this two term sequence includes coverage of elementary differential equations identical to that presented in the Standard Program Course MA 205. Development of theory provides the framework for the intermediate differential equations portion of the course which parallels the elective course MA 484. Fundamental existence and uniqueness theory is developed and applied to first order differential equations. The first term concludes with the study of the theory of linear differential equations including an introduction to systems of linear differential equations by matrix techniques. In the second term, the Sturm-Liouville boundary value problem is considered followed by development of the generalized Fourier Series and trigonometric Fourier Series. The theory of partial differential equations is introduced with particular emphasis on the application of the Sturm-Liouville theory. The probability theory and statistical inference portion is calculus based and is identical to that presented in MA 205 and MA 206. Credit for a one term elective in Differential Equations (Intermediate) is included in the 7 credit hours awarded at the completion of the second term.

7 Credit Hours.

MA 203-284 Differential Equations, Complex Analysis, and Probability Theory and Statistical Inference

Prerequisite: MA 158

The first one third of this two term sequence includes coverage of elementary differential equations identical to that presented in the Standard Program Course MA 205. The complex analysis portion of the course parallels the elective course MA 485 and provides an introduction to the theory of functions of a complex variable. The following topics are included: algebra of a complex variable, elementary functions, limits, derivatives, Cauchy's Integral Theorem and Formula, and series representation to include Taylor's and Laurent's Series. The first term concludes with the study of the theory of residues. In the second term, study of complex analysis continues with the study of the principles of conformal mapping and the Schwarz-Christoffel Transformation and their applications to the solution of two dimensional Dirichlet and Neumann type problems in temperature distribution, fluid flow and electrostatic potential. The probability theory and statistical inference portion is calculus based and is identical to that presented in MA 205 and MA 206. Credit for a one term elective in Complex Analysis is included in the 7 Credit Hours awarded at the completion of the second term.

7 Credit Hours.

ADVANCED PROGRAM II COURSES

MA 153 Advanced Placement Calculus and Analysis

Prerequisite: Selection by Head of Department

This course is the first term of an accelerated sequence designated as Advanced Program II. The study consists of introductory function theory, vector analytic geometry in two dimensions and a rigorous treatment of differential calculus for functions of a single real variable. *7 Credit Hours.*

MA 154 Advanced Placement Calculus and Linear Algebra

Prerequisite: MA 153

This is the second term course in Advanced Program II and a continuation of MA 153. The course includes a rigorous treatment of integral calculus for functions of a single real variable, infinite series and expansion of functions. It continues with vector calculus and the calculus of functions of several variables; including such topics as vector functions, partial differentiation, multiple integration and line and surface integrals. Vector calculus is completed with a consideration of Green's, the Divergence and Stokes' Theorems. The term concludes with a course in linear algebra including study of vector spaces, matrices, determinants, linear transformations, systems of linear equations and characteristic values.

7 Credit Hours.

MA 281-202 Vector Calculus and Differential Equations and Probability Theory and Statistical Inference

Prerequisite: MA 154 (Class of 1975 only).

The scope of the vector calculus portion of this course is essentially the same as MA 483, Vector Calculus, consisting of vector analysis and the differential and integral calculus of functions of more than one variable. It is offered to the cadets in the Class of 1975 whose study of calculus did not emphasize vector calculus. The differential equations portion covers first-order equations for which exact solutions are obtainable and solutions to higher-order linear differential equations with constant coefficients by the method of undetermined coefficients. The second term continues with the study of differential equations begun at the end of MA 281. The coverage is identical to that presented in the Standard Program Course MA 205. The probability theory and statistical inference subcourse is calculus based. Topics covered include those presented in MA 205-206 and in addition the Neyman-Pearson Lemma, maximum likelihood estimators and analysis of variance. The 3.5 credit hours of first term study are recorded as an elective. *7 Credit Hours.*

ADVANCED PROGRAM III COURSES

MA 155 Advanced Placement Calculus and Analysis

Prerequisite: Selection by Head of Department

This accelerated course provides a study of introductory function theory plus a rigorous treatment of differential and integral calculus, single variable, multivariable and vector functions. The scope encompasses the subject matter of the entire first year Standard Program calculus and analysis.

7 Credit Hours.

MA 156 Linear Algebra, Differential Equations, and Probability Theory and Statistical Inference

Prerequisite: MA 155

This course includes the work in linear algebra, differential equations, probability theory and statistical inference which is ordinarily covered in MA 205 and MA 206 *7 Credit Hours.*

MA 285-286 Vector Calculus, Complex Analysis, and Differential Equations (Intermediate)

Prerequisite: MA 156

This two-term sequence is intended primarily for cadets of Advanced Program III in order that they may earn credit equivalent to three important mathematics electives by the end of Third Class year. The coverage is essentially the same as that contained in MA 483, MA 485, and MA 484 taken in that order. The first term includes topics in vector calculus and the introductory lessons (15%) of complex analysis. Complex analysis is completed in the second term followed by intermediate differential equations. *7 Credit Hours.*

First and Second Classmen who have completed MA 206 with an A average will be considered for enrollment.

ELECTIVE COURSES

MA 481 Linear Programming

Second Term — Prerequisites: MA 206, MA 158, MA 154 or MA 156

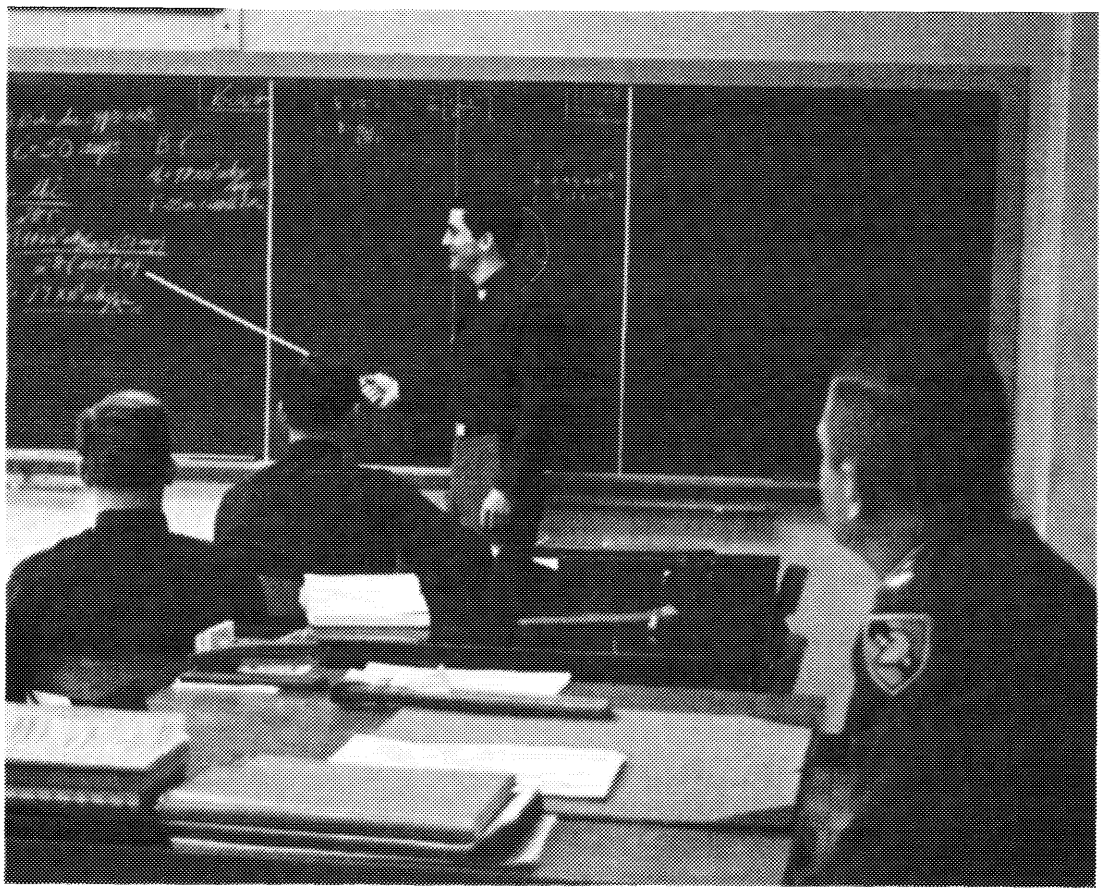
This course treats the optimal solution of a linear system. It includes an introduction to convex sets and n-dimensional geometry, a development of the linear programming problem, and the standard original and revised simplex computational procedures. The duality problems and degeneracy procedures of linear programming are included, and additional computational techniques applicable to specific mathematical models are investigated. The correspondence between the general linear programming problem and the theory of games is developed and demonstrated. Illustrative problems with emphasis on military applications are integrated throughout the course.

2.5 Credit Hours.

MA 482 Abstract Algebra

First Term — Prerequisites: MA 158, MA 281, MA 285 or MA 483. Permission of Head of Department.

This is an introductory course in modern algebra for cadets who plan to take graduate work in mathematics or work of a theoretical nature in physical science or engineering. The study of groups which includes normal subgroups, quotient groups and the fundamental homomorphism theorems dominates the first part of the course



The concepts of set theory, functions and polynomials are examined and developed at various vantage points of the course. The remainder of the course is devoted to rings, integral domains and fields. *2.5 Credit Hours.*

MA 483 Vector Calculus

First Term — Prerequisites: MA 106, MA 108, MA 154 or MA 156. (Open only to Classes of 1975 and earlier)

This course develops many of the basic mathematical tools used in science and engineering subjects. After a unit on vector algebra, the calculus of functions of several variables is taken up. Implicit function theory, curvilinear coordinates, chain rules and directional derivatives are covered in the differential theory. Results are applied in a study of parametrically and implicitly defined surfaces and space curves. Change of variable formulas for multiple integrals and surface area formulas are derived. The gradient, divergence and curl operators are studied. In the concluding unit on integral vector calculus, the theorems of Green, Gauss and Stokes are used to relate line, surface and volume integrals. Path independence of line integrals and the invariance of the divergence and curl are also treated. *2.5 Credit Hours.*

Not open to cadets who have completed MA 158, MA 281 or MA 285.

MA 484 Differential Equations (Intermediate)

Either Term — Prerequisite: MA 158, MA 281, MA 285, or MA 483

This course is an extension of the concepts developed in MA 205, MA 207, MA 201, MA 203, MA 281 and MA 156. Elementary techniques are reviewed. Techniques of solution by series methods are reviewed and extended. Existence and uniqueness theory is developed and is followed by a thorough treatment of the theory of linear differential equations. Systems of equations are studied with the aid of matrix techniques. The characteristic value problem and diagonalization through the use of similarity transformations are developed next. Sturm-Liouville boundary value problems and Fourier Series are considered and applied to the theory of partial differential equations.

2.5 Credit Hours.

Not open to cadets who have completed MA 282 or MA 286.

MA 485 Complex Analysis

Either Term — Prerequisite: MA 158, MA 281, MA 285, or MA 483

This course is an introduction to functions of a complex variable, including algebra of a complex variable, elementary functions, limits, derivatives, Cauchy's Integral Theorem and Formula, series representation to include Taylor's and Laurent's series, theory of residues, conformal mapping and linear transformations and special topics in complex potential. *2.5 Credit Hours.*

Not open to cadets who have completed MA 284 or MA 286.

MA 486 Numerical Analysis with Digital Computation

Second Term — Prerequisites: MA 206, MA 201, MA 203, MA 202, or MA 156

This course emphasizes the methods of numerical analysis with the digital computer in a strong supporting role. It includes methods that utilize the cadet's entire mathematical background in linear algebra, calculus, and differential equations in a context of modern numerical methods requiring programming and execution of solutions on the digital computer. Investigation of the generation, propagation, significance and control of error is emphasized. Programming ability beyond the material presented in EF 102 is desirable but not required. *2.5 Credit Hours.*

May be taken concurrently with MA 202 or MA 206.

MA 487 Real Variable Theory

Second Term — Prerequisites: One course from each group: MA 158, MA 281, MA 285 or MA 483; MA 284, MA 286 or MA 485. Permission of Head of Department.

Intended for cadets who plan to pursue graduate work in mathematics or work of a theoretical nature in physical science or engineering, this course examines the foundations of analysis and develops the theory of functions of real variables in a rigorous fashion. Introductory units on the development of the real number system, the properties of finite and infinite sets, and the concepts of topology provide the basis for a more rigorous discussion of the topics of elementary differential calculus — sequences, series, limits, continuity, differentiability and integration. Sequences and series of functions are studies in detail with emphasis on uniform convergence and its role in determining properties of the limit function. Power series are investigated fully. The concepts of monotone function, bounded variation, and Stieltjes integration are introduced. *2.5 Credit Hours.*

Department of Mechanics

Professor and Head of Department
COL FREDERICK A. SMITH, JR.,
B.S., United States Military Academy;
M.S.M.E., Johns Hopkins University;
M.B.A., George Washington University;
Ph.D., University of Illinois; Armed Forces Staff College;
The Industrial College of the Armed Forces

Professor and Deputy Head of Department
COL ROBERT M. WILSON,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology;
presently on sabbatical completing a Ph.D. at Lehigh University

Associate Professors
LTC JAMES K. STROZIER,
B.S., United States Military Academy;
M.S.E., University of Michigan;
Ph.D., University of Michigan
LTC CHARLES M. RADLER,
B.S., United States Military Academy;
M.S.C.E., University of Illinois;
Ph.D., University of Illinois
MAJ GARY R. HYDE,
B.S., United States Military Academy;
M.S.E., University of Michigan

Assistant Professors
LTC ROY A. ROBERTS,
B.C.E., Georgia Institute of Technology;
M.E., Texas A&M University
MAJ FRANK CARDILE,
B.S., United States Military Academy;
M.S., Stanford University
MAJ HENRY F. FAERY,
B.S., United States Military Academy;
S.M., Massachusetts Institute of Technology
MAJ IGOR D. GERHARDT,
B.S., United States Military Academy;
M.S., University of Southern California
MAJ ROBERT R. GLASS II,
B.S., United States Military Academy;
M.S., University of Michigan
MAJ JERRY C. HARRISON,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology
MAJ ROBERT H. KEWLEY,
B.S., United States Military Academy;
M.S., Stanford University
MAJ ANDREW K. KUSCHNER,
B.S., United States Military Academy;
M.S.M.E., University of Southern California
MAJ CHARLES S. MERRIAM II,
B.S., United States Military Academy;
M.S.E., University of Michigan
MAJ PAUL T. MURPHY,
B.S., United States Military Academy;
M.S., University of California at Los Angeles
MAJ NEIL K. NYDEGGER,
B.S., United States Military Academy;
M.S.E., Princeton University
MAJ PHILIP A. SYKES,
B.S., United States Military Academy;
S.M., Massachusetts Institute of Technology
CPT ROBERT M. AMRINE,
B.S., United States Military Academy;
S.M., Massachusetts Institute of Technology
CPT ROBERT R. CRAIGHILL, JR.,
B.S., United States Military Academy;
M.S., Stanford University
CPT PAUL F. MLAKAR,
B.S., United States Military Academy;
M.S., Purdue University

Instructors

MAJ WILLIAM O. COOMER,
B.S., United States Military Academy;
M.S., University of Arizona

MAJ OLEN L. EARNEST,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology

MAJ WARD A. LUTZ,
B.S., United States Military Academy;
M.S., California Institute of Technology

MAJ JAMES J. SATTERWHITE,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology

CPT JOSEPH R. CALEK,
B.S., United States Military Academy;
M.S., Stanford University

CPT GARY M. COGGINS,
B.S., United States Military Academy;
M.S., Rice University

CPT THOMAS E. FAREWELL,
B.S., United States Military Academy;
M.S., University of Illinois

CPT DONALD A. HALL,
B.S., United States Military Academy;
M.S., University of Texas

CPT JAMES KRIEBEL,
B.S., United States Military Academy;
M.S., Purdue University

CPT FLETCHER M. LAMKIN, JR.,
B.S., United States Military Academy;
M.S., University of California

CPT JEFFREY R. MADSEN,
B.S., United States Military Academy;
M.S., University of Colorado

CPT DAVID W. MILAM,
B.S., United States Air Force Academy;
M.S., University of Arizona

CPT BRINK P. MILLER,
B.S., United States Military Academy;
M.S., University of Illinois

CPT MARK W. POTTER,
B.S., United States Military Academy;
M.S., Stanford University

CPT BERNARD J. REILLY, JR.,
B.S., United States Military Academy;
M.S., Brown University

CPT RICHARD W. THODEN,
B.S., United States Military Academy;
M.S., Purdue University

CPT THOMAS C. WEAVER,
B.E.S., The Johns Hopkins University;
M.S., Cornell University

STANDARD COURSES

ME 301 Thermodynamics

Either Term

This course is a study of energy, energy transfer and the media used to accomplish this transfer. It includes a study of fundamentals, types of energy, properties of thermodynamic media, the first and second laws of thermodynamics, the ideal gas, thermodynamic processes, gas engine cycles, vapor power cycles, mixtures of ideal gases, nozzles and jet propulsion, refrigeration and heat transfer. In the laboratory, the cadet learns the correlation of theory and practice. The equipment used includes gasoline, diesel and fuel research engines; a steam laboratory demonstration unit, steam turbines, air compressors, gas turbines; and refrigeration and air conditioning units.

3.5 Credit Hours.

ME 302 Fluid Mechanics

Either Term

A study of the laws of mechanics as they apply to liquids, vapors, and gases. This course includes a study of fluid properties, principles of fluid statics, fluid dynamics, boundary layer and basic drag concepts, flow of compressible gases, dimensional analysis and dynamic similitude, flow of real fluids in conduits, flow measurements, dynamic drag and lift, turbo-machines, and open channel flow concepts. Practical exercises in the laboratory illustrate theory previously studied in

the classroom. Equipment used includes pumps, flow measurement devices, pipe friction measurement devices, a subsonic wind tunnel, a smoke tunnel and a supersonic nozzle thrust stand. The principles of fluidics are demonstrated during this phase. *3.5 Credit Hours.*

ME 303 Engineering Mechanics

Either Term

The relationships between external effects and force systems for particles and rigid bodies are developed by vector mathematics as an engineering science. The statics portion of the course includes a study of equilibrium in two and three dimensions, centroids, distributed forces, analysis of trusses and frames, shear and bending moment diagrams, and friction. The dynamics portion of the course consists of a study of kinematics and kinetics for both particles and rigid bodies. Newton's Second Law, work-energy and impulse-momentum methods are used in both particle and rigid body dynamics.

3.5 Credit Hours.

ADVANCED COURSES

ME 351 Advanced Thermodynamics

Either Term — Prerequisite: Demonstrated superior ability in Chemistry, Physics and Mathematics, and/or Fluid Mechanics and Engineering Mechanics.

A more sophisticated coverage of the subject matter of ME 301 with the addition of such material as microscopic concepts, non-reacting and reacting mixtures, fluid flow, heat transfer, and direct energy conversion devices. Emphasis is placed on fundamental concepts, models, and laws of thermodynamics. Systematic methodology is stressed using a wide range of engineering applications. The laboratory sessions provide a correlation of theory and practice. The equipment used includes gasoline, diesel and fuel research engines, steam engines and turbines, air compressors, gas turbines, and refrigeration and air conditioning units. *3.5 Credit Hours.*

ME 352 Advanced Fluid Mechanics

Either Term — Prerequisite: Demonstrated superior ability in Chemistry, Physics, Mathematics and/or Thermodynamics and Engineering Mechanics.

A vector-oriented coverage of the topics listed in ME 302, with emphasis on the theoretical and mathematical development of the general laws of fluid mechanics. A knowledge of vector algebra is assumed; however the field operators of vector calculus are developed carefully and thoroughly. Practical exercises in the laboratory illustrate theories developed in the classroom. Equipment available includes pumps, turbines, flow measurement devices, pipe friction measurement devices, supersonic, subsonic and smoke tunnels and a supersonic nozzle thrust stand.

3.5 Credit Hours.

ME 353 Advanced Engineering Mechanics

Either Term — Prerequisite: Demonstrated superior ability in Physics and Mathematics.

Coverage of the subject material of ME 303 is accelerated. Also included are space trusses, virtual work, stability, gyroscopic motion, general space motion of a rigid body, and a section on dynamics of non-rigid systems which includes variable mass, generalized coordinates. Lagrange's equations and Hamilton's principle.

3.5 Credit Hours.

ELECTIVE COURSES

ME 384 Mechanics of Materials

Either Term — Prerequisite: ME 303 or ME 353

This course develops the elastic and inelastic relationships between external forces (loads) acting on deformable bodies and the stresses and deformation produced. The study includes centric, torsional, flexural and combined loading, beam theory, column theory, and the influence of properties of material. Creep, fatigue and brittle fracture are introduced. Five laboratory exercises illustrating the above principles are conducted during the course. *3.5 Credit Hours.*

ME 387 Introduction to Applied Aerodynamics

Either Term — Prerequisite: ME 302 or ME 352

This course is designed to provide cadets with an understanding of modern aerodynamics and a

background on the increasing complexity of aircraft design and current advances in aircraft. It includes a review of fluid properties as related to the atmosphere, evaluation of aerodynamic forces, airfoil theory, aircraft performance, flight stability, and helicopter aerodynamics. Classroom work is supplemented with laboratory exercises using wind tunnels. *2.5 Credit Hours.*

ME 388 Aerodynamics of V/Stol Flight

Either Term — Prerequisite: ME 302 or ME 352

This course provides the student with an introductory coverage of vertical/short take-off and landing aerodynamics with an emphasis on helicopters. Beginning with a review of basic aerodynamics, the course moves into propeller theory and helicopter rotor theory. The aerodynamics of short take-off and landing aircraft are covered as are the special areas of jet flaps, ground effect machines, lift augmentation through boundary layer control and ducted propellers for vertical flight. Applications of theory are provided by laboratory exercises and aerial flights.

2.5 Credit Hours.

ME 471 Aerospace Propulsion

Either Term — Prerequisite: ME 302 or ME 352

This course covers the fundamentals of propulsion as applied to jet and rocket engines. The course includes a development of the mechanics and thermodynamics of fluid flow in jets and rockets and a study of turboprop, turbojet, ramjet, turbofan, chemical rocket, nuclear rocket and electric propulsion engines. *2.5 Credit Hours.*

ME 472 Direct Energy Conversion

Either Term — Prerequisite: EE 301 and ME 301 or ME 351

This course in modern conceptual thermodynamics begins with a review of classical thermodynamics and an introduction to statistical mechanics, transport theory, electromagnetic theory and solid state theory. The course then treats in turn the five major methods of direct energy conversion: thermoelectricity, photovoltaics, thermionics, magnetohydrodynamics and fuel cells. Laboratory exercises supplement classroom instruction. *2.5 Credit Hours.*

ME 473 Experimental Mechanics

Either Term — Prerequisites: ME 301 or ME 351, ME 302 or ME 352, ME 303 or ME 353.

This course begins with an introduction to experimental planning and execution. The cadet then selects and performs several experiments. Instruction on instrumentation and measurement techniques is integrated into the experimental portion of the course. Modern equipment available includes, in part, wind tunnels, open channel flow devices, fuel research engines, fluidics devices, electromechanical shaker, materials testing equipment and polariscopes.

2.5 Credit Hours.

ME 481 Compressible Aerodynamics

Either Term — Prerequisite: ME 302 or ME 352

A coverage of the basic principles of fluid dynamics and thermodynamics to include both subsonic and supersonic compressible flow. Principal analysis is one-dimensional covering isentropic flow, normal shock waves, and flow with either friction or heat transfer. Introduction is made to two and three dimensional supersonic flow with a study of oblique shock waves and expansions, and conical shock waves. Application is provided thorugh the use of subsonic and supersonic wind tunnels, a water table, and a design problem.

2.5 Credit Hours.

ME 482 Heat Transfer

Either Term — Prerequisite: ME 302 or ME 352

This course includes the development of the basic principles of heat transfer by conduction, convection and radiation. Application of these basic fundamentals is made to boilers, condensers, heat exchangers, ablative protection of reentry vehicles and thermal control in aerospace vehicles. Mass and Momentum transfer are discussed through their similarity to heat transfer. Laboratory exercises on conduction, convection and radiation supplement classroom work. *2.5 Credit Hours.*

ME 483 Space Mechanics

Either Term — Prerequisite: PH 201 or PH 251

An introduction to the trajectory problem of the space vehicle applying the principles of mechanics to the motion of bodies in space acted upon by a central force field. The course includes a study of central force motion, and dynamics of two body conic orbits, ballistic missile trajector-

ies, principal coordinate systems, orbit determination, and interplanetary trajectories. Brief consideration is given to orbits about an oblate earth, perturbations, the three body problem, and the n body problem. *2.5 Credit Hours.*

ME 484 Aerospace Structures

Either Term — Prerequisite: ME 303 or ME 353

This course presents the development of the energy principles of classical mechanics, with applications to aircraft, missiles, and space vehicles. The course includes an introduction to variational methods, potential and complementary energy, and energy principles of elasticity. The principles of classical mechanics are applied to the bending and torsion of thin-walled, reinforced, determinate and indeterminate aerospace structures. Deflection analysis and the effects of tape are also considered. *2.5 Credit Hours.*

ME 485 Continuum Mechanics

Either Term — Prerequisite: ME 384

This course forms a foundation for deeper study in elasticity. Necessary concepts and theorems of tensor geometry are developed at the start. Study of state of stress, the fundamental momentum and energy theorems, and constitutive equations form the foundation. Applications to problems with elastic materials are included.

2.5 Credit Hours.

ME 486 Mechanical Vibrations

Either Term — Prerequisite: ME 303 or ME 353

This introductory course in vibrations provides the necessary background for continued development in this rapidly expanding field. Free, damped, and forced vibrations of the linear single degree of freedom system are covered in detail. Multi-degree of freedom systems are studied with particular attention on matrix analysis, numerical methods and computer solutions. The response of mechanical systems to random loads and selected non-linear response phenomena are introduced. Analytical methods for determining the characteristics of dynamic response are frequently verified by classroom and laboratory demonstrations. *2.5 Credit Hours.*

ME 488 Flight Mechanics

Either Term — Prerequisite. ME 387 (May be taken concurrently)

This course introduces the analysis of fixed and rotary wing aircraft performance, stability, and control during flight. Beginning with a review of the fundamental equations of motion, aircraft performance characteristics are developed. Static and dynamic stability and the effect of control surface on dynamic stability are considered in detail. Applications of theory are provided by laboratory exercises and aerial flights.

2.5 Credit Hours.

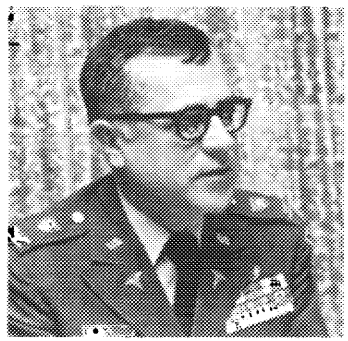
ME 489 Individual Mechanics Project

Either Term — Prerequisites: ME 301 or ME 351, ME 302 or ME 352, ME 303 or ME 353, permission of Head of Department.

This course permits the cadet to do advanced or specialized study or an undergraduate research project in the field of Applied Mechanics, Aerodynamics, Aerospace Structures, or Astronautics. The cadet chooses a plan for his own program and is individually supervised by a faculty advisor.

2.5 Credit Hours.

Department of Military Hygiene



Professor and Head of Department
COL LLOYD B. McCABE,
M.D., Saint Louis University School of Medicine

Assistant Professors
LTC PETER H. PATTERSON,
B.A., Dartmouth College;
M.D., Tufts University
MAJ DAVID B. McQUILLAN,
B.A., Catholic University;
M.A., Baylor University

The Department of Military Hygiene presents instruction to all four cadet classes.

Fourth Classmen receive instruction in Personal Hygiene, Field Sanitation, Self and First Aid, Sex Hygiene, and Adverse Effects of Alcohol, Tobacco and Drugs.

Third Classmen receive instruction on Medical Department Organization and Support of the Army, effects of the environment on military operations and troops in the field and additional instruction in First Aid, with emphasis on the responsibility of the Commander at the unit level.

Third, Second, and First Classmen receive additional instruction in Drug Abuse with emphasis on the aspects of troop leadership and, for First Classmen, the additional aspect of heads of family responsibilities. Additional instruction in Sex Hygiene is presented to Second Classmen during pre-AOT. Pre-marital instruction and counselling are available to First Classmen.

Department of Physics

Professor and Head of Department
COL EDWARD A. SAUNDERS,
B.S., United States Military Academy;
M.S.E.E., Purdue University;
Ph.D., Rensselaer Polytechnic Institute

Professor and Deputy Head of Department
LTC WENDELL A. CHILDS,
B.S., Auburn University;
M.S., Stevens Institute of Technology;
Ph.D., University of Virginia

Associate Professors
COL LOREN E. RADFORD,
B.S., University of Washington;
M.S., University of Virginia;
Ph.D., University of Virginia
LTC ARTHUR P. DEVERILL, JR.,
B.S., United States Military Academy;
M.S., (NE), University of Virginia
MAJ JAMES S. WILLIS, JR.,
B.S., United States Military Academy;
M.S., Ph.D., Rensselaer Polytechnic Institute

Assistant Professors
LTC ROBERT L. LaFRENZ,
B.S., United States Military Academy;
M.S., Iowa State University;
Ph.D., Iowa State University
LTC AUSTIN LOWREY, III,
B.S., University of Hawaii;
M.S., United States Naval Postgraduate School;
Ph.D., Massachusetts Institute of Technology
MAJ ROGER C. ANDREWS,
B.S., United States Military Academy;
M.S., United States Naval Postgraduate School
MAJ MAX R. BARRON,
B.S., United States Military Academy;
M.S., Purdue University
MAJ ROBERT E. DONOVAN,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology
MAJ CLYDE L. HUMPHREY,
B.S., Southwest Missouri State College;
M.S., University of Virginia
MAJ DAVID S. JACKSON,
B.S., United States Military Academy;
M.S., University of Michigan
MAJ HARTMAN B. MOWERY,
B.S., United States Military Academy;
M.S., Purdue University
MAJ GEORGE A. ORLICKI,
B.S., United States Military Academy;
M.S., United States Naval Postgraduate School
MAJ FRED R. POCOCK,
B.S., University of Illinois;
M.S., Pennsylvania State University
MAJ ROBERT M. STEELE,
B.S., United States Military Academy;
M.S., Pennsylvania State University
CPT JESSE MOSS, JR.,
B.S., Hampton Institute;
M.S., University of Connecticut

Instructors
MAJ WILLIAM T. KELLEY,
B.S., United States Military Academy;
M.S., University of Illinois
MAJ PHILIP H. MALLORY,
B.S., United States Military Academy;
M.S., University of California (Davis)
MAJ WAYNE D. WILLIS,
B.S., United States Military Academy;
M.S., University of Virginia
CPT ROBERT A. BALDERSON,
B.S., United States Military Academy;
M.S., Pennsylvania State University

CPT FRED M. BELANGER,
B.S., United States Military Academy;
M.S., University of California (Davis)
CPT ANTHONY J. BUETTI,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology
CPT ROY S. FINNO,
B.S., United States Military Academy;
M.S., United States Naval Postgraduate School
CPT ROBERT M. FREY,
B.S., United States Military Academy;
M.S., Pennsylvania State University
CPT WILLIAM G. GANG,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology
CPT DENNIS R. GILSON,
B.S., United States Military Academy;
M.S., Air Force Institute of Technology
CPT JAMES E. HARVEY,
B.S., United States Military Academy;
M.S., Dartmouth College
CPT LELAND H. HEWITT,
B.S., United States Military Academy;
M.S., University of Arizona
CPT MICHAEL W. HUSTEAD,
B.S., United States Military Academy;
M.S., Purdue University
CPT MARTIN L. JOHNSON, JR.,
B.S., United States Military Academy;
M.S., Purdue University
CPT HUGH P. MORTON,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology
CPT JOHN M. PICKLER,
B.S., United States Military Academy;
M.S., University of Virginia
CPT TERRENCE C. SALT,
B.S., United States Military Academy;
M.S., University of Colorado
CPT PATRICK E. WALKER,
B.S., University of Oklahoma;
M.S., Purdue University
CPT RONALD L. WEITZ,
B.S., United States Military Academy;
M.S., Purdue University

STANDARD COURSES

PH 201 Physics I

First Term — Prerequisites: None

This course provides a common introduction to two distinct physics sequences which begin in the second term with PH 202 and PH 204. The course is a comprehensive calculus-based study of mechanics to include the laws of translational and rotational motion, conservation principles and oscillatory motion. A laboratory program designed to develop an appreciation of scientific techniques and to illustrate fundamental physical concepts is an integral part of the course.

3.5 Credit Hours.

PH 202 Physics II

Second Term — Prerequisites: PH 201

This course is a calculus-based study of the fundamentals of electricity, magnetism, and optics. A comprehensive laboratory program is an integral part of the course. The emphasis is on problem solving and experimental techniques in support of future work in the sciences or engineering.

3.5 Credit Hours.

PH 204 Physics II

Second Term — Prerequisites: PH 201

This course is a calculus-based study of the fundamentals of electricity, magnetism, and optics. Emphasis is placed on understanding the nature and significance of the basic physical principles. A program designed to acquaint the student with the history and philosophy of science and the interface of physics with other disciplines is begun.

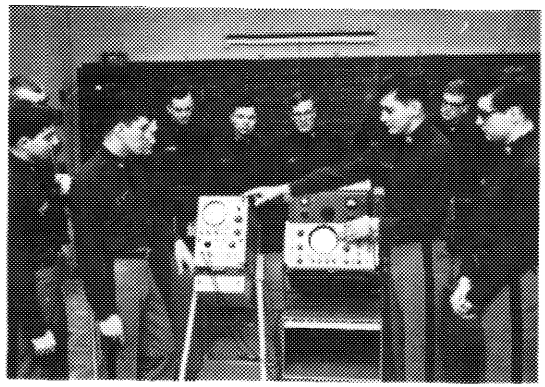
3.5 Credit Hours.

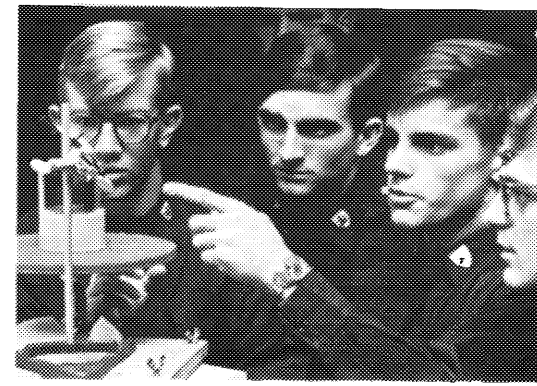
PH 303 Physics III

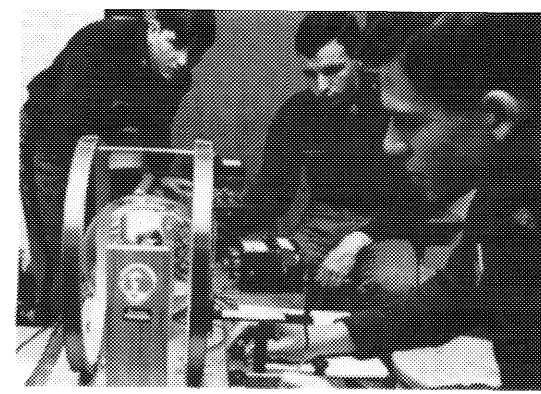
Either Term — Prerequisites: PH 201 and PH 202 (Students from PH 204 may be permitted to take this course with Department permission).

A continuation of the PH 201 - PH 202 sequence designed to provide the student interested in science or engineering with the fundamentals of quantum physics as applied to atoms, molecules, solids and nuclei, and some of the applications arising therefrom. A laboratory program designed to familiarize the student with radiation detection and counting devices is an integral part of the course.

4 Credit Hours.







PH 305 Physics III

Either Term — Prerequisites: PH 201 and PH 204 (Students from PH 202 may be permitted to take this course with Department permission.)

A continuation of the PH 201 - PH 204 sequence designed to provide the student interested in fields other than science and engineering with the fundamentals of quantum physics, special relativity, and the structure of matter on the microscopic scale. The program begun in PH 204 concerning the impact of science and technology on society, the history of science and the interface of physics with other disciplines is continued.

3.5 Credit Hours.

ELECTIVE COURSES

PH 383 Introduction to Theoretical Physics I

First Term — Prerequisite: PH 201

An intermediate development of selected topics in theoretical physics. Topics covered include the Lagrangian formulation of mechanics, with selected problems in dynamics, central force motion, rigid body motion, and a study of vibration and wave phenomena to include free and forced vibrations, normal modes, and progressive waves.

2.5 Credit Hours.

PH 384 Introduction to Theoretical Physics II

Second Term — Prerequisite: PH 202

An intermediate development of selected topics in theoretical physics. Topics covered include Maxwell's equations, interactions of electromagnetic waves with boundary surfaces and a study of special relativity. *2.5 Credit Hours.*

PH 483 Solid State Physics

Second Term — Prerequisite: PH 303

A course in the fundamentals of solid state physics covering crystal structure and the important mechanical, electrical, magnetic and thermal properties of crystals. Included are discussions of the band theory of metals and semiconductors and classical and quantum statistics pertinent to solid state theory. *2.5 Credit Hours.*

PH 484 Quantum Mechanics

First Term — Prerequisite: PH 303

An introductory course stressing the physical meaning of quantum theory to include the mathematical methods employed in the Schroedinger formulation of quantum mechanics. The solutions of barrier problems, the harmonic oscillator, and the hydrogen atom problem are investigated. Perturbation and scattering theories are developed. *2.5 Credit Hours.*

PH 486 Experimental Physics

Either Term — Prerequisites: PH 303 and one elective in Physics

Individual advanced laboratory experiments selected by the student and designed to develop experimental ability and to introduce techniques of laboratory research. Possible experiments include: normal modes of coupled systems, laser optics, electron paramagnetic resonance, Mössbauer effect, Compton scattering, scintillation spectrometry and various nuclear experiments. *2.5 Credit Hours.*

PH 487 Nuclear Reactor Theory

Either Term — Prerequisite: PH 303

An introductory course covering the physical principles underlying the theory and operation of thermal reactors. The course includes a review of physics pertaining to reactor theory and radiation detection, a study of neutron diffusion and moderation, homogeneous and heterogeneous reactors and an investigation of transient effects and reactor controls. A laboratory program integral to the course includes exercises in radiation detection, neutron activation and cross-section determination, thermal diffusion and flux distribution measurement. *2.5 Credit Hours.*

PH 488 Nuclear Physics

Second Term — Prerequisite: PH 303

A study of selected topics in nuclear physics designed to develop an appreciation for the structure of the nucleus, the role of quantum mechanics in nuclear phenomena, and the nature of observed nuclear reactions. Included are studies of alpha decay, the deuteron, nuclear forces, nuclear models, scattering, and an introduction to fundamental particle classification. *2.5 Credit Hours.*

PH 489 Special Topics in Physics

Either Term — Prerequisites: PH 303, two electives in Physics, and permission of Head of Department.

Individually supervised research and study in a selected problem area. *2.5 Credit Hours.*

Department of Social Sciences

Professor and Head of Department
COL LEE D. OLVEY,
B.S., United States Military Academy;
B.A., M.A., Oxford University;
Ph.D., Harvard University

Associate Professors
COL GEORGE K. OSBORN, III,
B.A., M.A., Ph.D., Stanford University
LTC WALLEN M. SUMMERS,
B.S., University of California at Davis,
B.S., United States Military Academy;
M.P.A., Harvard University
LTC WILLIAM J. TAYLOR, JR.,
B.S., University of Maryland;
M.A., Ph.D., American University
LTC WILLIAM M. WIX,
B.S., United States Military Academy;
M.S., Massachusetts Institute of Technology
MAJ HOWARD D. GRAVES,
B.S., United States Military Academy;
B.A., M.A., B.Litt., Oxford University

Assistant Professors
DR. CRAIG BAXTER,
B.S., A.M., Ph.D., University of Pennsylvania
MAJ MONTE R. BULLARD,
B.A., University of Michigan;
M.A., University of Hawaii

MAJ JON J. EICHE,
B.S., East Tennessee State College;
M.A., Indiana University

MAJ RICHARD C. GALLAGHER,
B.S., United States Military Academy;
M.P.A., Princeton University

MAJ JAMES R. HARDING,
B.S., United States Military Academy;
M.B.A., Harvard Business School

MAJ WILLIAM D. HENDERSON,
B.A., Stanford University;
M.A., University of Pittsburgh

MAJ BRODER L. JERVELL,
B.S., United States Military Academy;
M.A., University of Denver

MAJ HENRY J. KENNY,
B.S., United States Military Academy;
M.A., American University

MAJ JOHN R. LANDRY,
B.S., United States Military Academy;
M.P.A., Harvard University

MAJ JOHN R. MONTEFUSCO,
B.A., City College of New York;
M.A., Ohio State University

MAJ DAVID K. RIGGS,
B.S., United States Military Academy;
License, University of Geneva

MAJ BARRY J. ROLLER,
B.S., United States Military Academy;
M.A., Syracuse University

MAJ WARNER D. STANLEY,
B.S., United States Military Academy;
M.P.A., Harvard University

MAJ FRANCIS M. WRIGHT, JR.,
B.S., United States Military Academy;
M.A., University of Colorado

CPT LLOYD C. BRIGGS,
B.S., United States Military Academy;
M.B.A., Harvard Business School

CPT DANIEL W. CHRISTMAN,
B.S., United States Military Academy;
M.S.E., M.P.A., Princeton University

CPT WESLEY K. CLARK,
B.S., United States Military Academy;
B.A., M.A., Oxford University

CPT DONALD A. MAHLEY,
B.A., Purdue University;
M.A., University of Pittsburgh

Instructors

LTC JOSEPH J. HEINLEIN, JR.,
B.A., Duquesne University;
M.A., American University

MAJ RAOUL H. ALCALA
B.S., United States Military Academy;
M.A., Yale University

MAJ RICHARD H. BEAL,
B.A., Texas A&M;
M.A., University of Washington

MAJ CLETUS A. BELSOM,
B.B.A., Tulane University;
M.A., Michigan State University

MAJ THOMAS M. BRENDLE,
B.S., United States Military Academy;
M.A., M.A.L.D., Ph.D., Tufts University

MAJ WARREN E. CLARKE,
B.E., Yale University;
M.B.A., Harvard University

MAJ JAMES R. ELLIS,
B.S., United States Military Academy;
M.P.A., Princeton University

MAJ SHERWOOD D. GOLDBERG,
B.A., Dickinson College;
M.A., University of Pennsylvania

MAJ CARL H. GROTH, JR.,
B.S., United States Military Academy;
M.A., University of California at Los Angeles

MAJ CHARLES D. HARTMAN,
B.S., United States Military Academy;
M.A., University of Wisconsin

MAJ CARL M. A. McCARDEN,
B.A., Providence College;
M.P.A., Princeton University

MAJ CARL O. P. MAGNELL,
B.S., United States Military Academy;
M.S., M.A., Massachusetts Institute of Technology

MAJ JOHN R. NEVINS,
B.S., United States Military Academy;
M.P.A., D.P.A, Syracuse University

MAJ STANLEY W. RUSSELL,
B.A., The Citadel;
M.A., The Ohio State University

MAJ DON M. SNIDER,
B.S., United States Military Academy;
M.A., M.P.A., University of Wisconsin

MAJ PETER H. WARD,
B.A., M.A., Cornell University

CPT LLOYD K. BROWN,
B.S., United States Military Academy;
M.S., M.A., Stanford University

CPT BRUCE B. G. CLARKE,
B.S., United States Military Academy;
M.A., University of California at Los Angeles

CPT JAMES R. GOLDEN,
B.S., United States Military Academy;
M.P.A., Ph.D., Harvard University

CPT FRANKLIN Y. HARTLINE,
B.S., United States Military Academy;
M.B.A., University of Pennsylvania

CPT RICHARD A. KNUDSON,
B.S., United States Military Academy;
M.P.A., Harvard University

CPT DANIEL B. LINCOLN,
B.A., University of Colorado;
M.A., University of Denver

CPT BARRY R. McCAFFREY,
B.S., United States Military Academy;
M.A., American University

CPT JAMES S. McCALLUM,
B.S., United States Military Academy;
M.P.A., Princeton University

CPT WILLIAM F. MURDY, II,
B.S., United States Military Academy;
M.B.A., Harvard Business School

CPT WILLIAM C. RENNAGEL,
B.S., United States Military Academy;
M.A., Ohio State University

CPT DONALD S. ROWE,
B.S., United States Military Academy;
M.A., Yale University

CPT RICHARD H. SINNREICH,
B.S., United States Military Academy;
M.A., Ohio State University

CPT HUBA WASS DE CZEGE,
B.S., United States Military Academy;
M.P.A., Harvard University

STANDARD COURSES

SS 301 Economic Principles and Problems
First Term — Prerequisites: None
A survey in basic economic principles and their application to public policy in this and following courses. Macroeconomic and microeconomic analysis, and rational decision making methods are studied. Analysis is applied in economic policy case studies. *2.5 Credit Hours.*

SS 302 United States Government and Economics of National Security
Second Term — Prerequisites: None
A study of the American political system with emphasis on the processes and problems of the national government, including a survey of basic aspects of state and local administration. The subcourse in Economics of National Security studies defense decision-making as a problem of resource allocation within the political and economic environment of the nation.
2.5 Credit Hours.

SS 401 Comparative Political Systems: Europe and Asia
First Term — Prerequisites: None
A foundation of fundamental concepts of political science, particularly of comparative politics, and an analysis of various political systems of Europe (Great Britain and the USSR) and Asia (China and Japan). The study of the Asian nations includes a survey of the nations' historical backgrounds. *3.5 Credit Hours.*

SS 407 International Relations
Second Term — Prerequisites: None
An interdisciplinary study of the relations between nations, buidling upon previous Social Sciences courses, with particular emphasis on the role of the United States in the international system. Both action and interaction theory are studied. *3.5 Credit Hours.*

ADVANCED COURSES

SS 351 Economics: Principles and Problems
First Term — Prerequisite: Permission of the instructor.
This course provides qualified volunteers with (1) a rigorous understanding of the basic principles of microeconomic and macroeconomic theory and (2) competence in an analytic method which can be applied to a wide range of optimization and public policy problems.
2.5 Credit Hours.

SS 352 United States Government and Economics of National Security
Second Term — Prerequisite: Permission of the instructor.
Analysis of the political process as a vehicle for governmental policy development. The course presents in depth the complex interplay between politics and substantive issues in public policy. Extensive use of case materials drawn from contemporary issues in government.
2.5 Credit Hours.

SS 451 Comparative Political Systems: Europe and Asia
First Term — Prerequisite: Student selection is based upon demonstrated performance in the Social Sciences.
This course will emphasize a developmental approach to the comparative study of selected political systems in Europe and Asia. Problems and prospects of modernization and political development will be examined. Case studies will be utilized to provide greater appreciation of the dimensions of the problems and political processes in the states studied. *3.5 Credit Hours.*

SS 457 Advanced International Relations
Second Term — Prerequisite: Permission of the instructor.
This advanced course covers the concepts, theories, and methodologies pertaining to the academic pursuit of international politics. The course is tailored to allow cadets to pursue their individual interest in the field. In this sense, it is a capstone course that builds not only on previous social sciences courses but on the total academic program as well. *3.5 Credit Hours.*

ELECTIVE COURSES

SS 372 Policy and Administration
Second Term — Prerequisite: SS 302 or SS 352. May be taken concurrently.
The focus of the course is upon modern methods of policy development and control including

organizational, personnel, budgetary and analytical techniques. Cadets are exposed to the central position of public administrators in the governmental process, and the problems of policy control in large bureaucratic organizations.

2.5 Credit Hours.

SS 373 Quantitative Analysis in the Social Sciences

First Term — Prerequisite: MA 205 or MA 207.

Course may be taken concurrently with SS 301. This course is designed to develop skills in the application of quantitative analytical tools to problems in political science, international relations, and economics. After gaining a degree of facility with quantitative methods, the cadet will design, research, and execute an original analysis of a policy issue or problem in his specific area of interest in the social sciences. *2.5 Credit Hours.*

SS 383 Middle Eastern Studies

Either Term — Prerequisite: None

An introduction to the problems of the contemporary Middle East and North Africa. A brief consideration of the development of the Arab and Ottoman Empires, the growth of Islam, and penetration of the area by European states provides the foundation for an intensive study of the national political goals, social problems, and economic prospects of the present day. The Arab-Israeli conflict and the Soviet-American rivalry in the region also receive special attention.

2.5 Credit Hours.

SS 384 Government and Politics of Latin America

Either Term — Prerequisite: None

This course surveys the economic, social, cultural, and political systems of contemporary Latin America. It begins by discussing the historical evolution of the region's economy, society and culture, and the political systems of specific countries. Special emphasis is given to the demands of peasants, workers, urban poor, traditional conservatives, military and middle sectors, and to Latin American styles of political decision making.

2.5 Credit Hours.

SS 385 Comparative Economic Systems

Either Term — Prerequisite: SS 301. May be taken concurrently.

This course analyzes Capitalism, Market Socialism, and Command Socialism as economic systems. The history, evolution, and application of these systems are studied with particular emphasis on the American and the Soviet bloc economies of today. Divergent methods of solving problems associated with the efficient allocation of resources, distribution of income, economic growth, and stability are analyzed and compared.

2.5 Credit Hours.

SS 386 Political Philosophy

Either Term — Prerequisite: None

An introduction to the classic writings of Western political philosophy with a consideration of their application to contemporary problems. The course examines in particular the philosophy of American government and the challenges presently facing it. The course also examines certain concepts of moral, legal and general philosophy and their relation to political philosophy.

2.5 Credit Hours.

SS 387 Seminar in Public Policy

Either Term — Prerequisites: SS 301 and SS 302 or their equivalent. May be taken concurrently with SS 302.

The seminar provides cadets with an opportunity to read and analyze the nature and dimensions of America's urban crisis. Emphasis is placed on the racial, economic, and political aspects of the crisis in major metropolitan areas throughout the country, and the ability of our political process to resolve these domestic problems.

2.5 Credit Hours.

SS 388 Macroeconomics: Theory and Policy

Second Term — Prerequisite: SS 301.

This course covers the primary aspects of macroeconomic theory and national economic policy. Models of the economy will be analyzed and evaluated in light of such economic goals as full employment, price stability and economic growth. The course is designed to offer a blend of aggregate economic theory, empirical analysis and policy considerations. *2.5 Credit Hours.*

SS 389 Managerial Economics

First Term — Prerequisite: None.

The course is a study of managerial decision-making in directing and controlling an on-going organization. Managerial accounting is used to

enable cadets to analyze and use financial information in realistic case studies. Cost accounting provides the primary discipline of study with an emphasis toward problem solving.
2.5 Credit Hours.

SS 471 Major Political Systems of East Asia
Second Term — Prerequisite: None.
The course examines the transformation of East Asia in the 19th and 20th centuries and the salient features of the contemporary political systems of the People's Republic of China. *2.5 Credit Hours.*

SS 475 Government and Politics of the Soviet Union
Second Term — Prerequisites: None.
An interdisciplinary study of the Soviet political system, which begins with a survey of the traditional concepts of Karl Marx and their application to a modernizing Russia by Lenin and Stalin, and moves to consideration of the formal institutions of government, interest groups, the armed forces, and the Communist Party of the Soviet Union. Emphasis will be placed on structure, functions, interaction, and problems involved in the working of the system. *2.5 Credit Hours.*

SS 476 International Affairs: Theory and Applications
Second Term — Prerequisite: Approval of Instructor.
A study in depth of the traditionalist view of international politics, and some of its more modern challengers. Emphasis is placed on a realistic assessment of capabilities and limitations of theories and the problems of practical application in the world arena. *2.5 Credit Hours.*

SS 482 Microeconomics: Theory and Applications

Second Term — Prerequisite: SS 301.

This is an intermediate level course in microeconomic theory which emphasizes applications of economic analysis to defense and other governmental decisions and to the decision-making problems of business. The concepts and principles of marginal analysis are applied to the development of efficient defense policies regarding force structure, force levels, and weapons systems, to the examination and economic evaluation of various social issues, and to an analysis of the decision problems faced by business. *2.5 Credit Hours.*

SS 483 National Security Seminar

Either Term — Prerequisites: SS 301 and SS 302. Course may be taken concurrently with SS 301 by cadets who have completed or validated SS 302, or concurrently with SS 302.

This professionally oriented seminar examines selected major issues affecting the national security of the United States in the nuclear age. The primary focus of the seminar is toward future and emerging challenges to national security. It examines internal violence abroad; it evaluates the policy impact of international and local war; it addresses the evolving character of strategic nuclear deterrence and strategy; it outlines the threat and promise of the explosion of military technology; and it discusses the impact of modern decision-making techniques upon the national security establishment. *2.5 Credit Hours.*

SS 484 International Economics and Economic Development

Second Term — Prequisite: SS 301.

This course provides a foundation in international economic theory and the theory of economic growth and uses it in the study of problems and issues in economic development. It covers the classical theory of comparative advantage and its modifications. Among the policy issues to be explored are domestic issues such as direct allocation versus allocation by the price system, and international issues such as foreign aid, and private foreign investment. *2.5 Credit Hours.*

SS 485 Problems of the Developing Nations

Either Term: Prerequisite: SS 302. May be taken concurrently.

The course attempts to develop analytical tools and concepts useful for understanding the political processes, social structures and economic organization normally associated with traditional societies. The course draws upon ideas, insights, and examples from the literature of political science, sociology, economics, and cultural anthropology, and focuses upon the application of these theories to selected case studies in East Asia and Sub-Saharan Africa. *2.5 Credit Hours.*

SS 486 Political and Cultural Anthropology

Either Term — Prerequisite: None.

This course emphasizes the comparative analysis of various levels of society and examines the general theories about the role of culture as man's major adaptive mechanism in negotiating social and political change. Case studies of several diverse societies, ranging from the primitive to the complex industrial state are made in order to point out the value and applicability of anthropology. *2.5 Credit Hours.*

SS 487 Public Policy Decision Making and Debate

First Term — Prerequisite: Permission of the course director.

The course provides formal instruction in the techniques of rational decision making and persuasive argumentation, to develop in-depth skills of research in the area of governmental policy making, and to provide detailed, substantive knowledge concerning the policy issues of the national debate topic. *2.5 Credit Hours.*

SS 489 Individual Social Sciences Project

Either Term — Prerequisite: Approval of the Head of the Department.

This course permits the cadet, in an environment that is conducive to independent effort, to accomplish original research or specialized study in the fields of economics, political science, or international affairs. *2.5 Credit Hours.*

Courses within Areas of Concentration and Associated Elective Fields

BASIC SCIENCE AREA

Each cadet who elects to concentrate in the Basic Science Area must satisfy the following requirements:

a. Complete a Core Program engineering sequence other than General Engineering.
b. Complete six elective courses selected as follows:
   1. Five selected from Basic Science Area list *or* five selected in accordance with the requirements of the Chemistry, Physics, or Mathematics field, *and*
   2. One selected from among the entire elective course offerings.

Basic Science Area Elective Course List:

CH 383 Organic Chemistry I
CH 384 Organic Chemistry II
CH 481 Physical Chemistry I
CH 482 Physical Chemistry II
CH 485 Human Biology I
CH 486 Human Biology II
CH 489 Chemistry Research
EF 383 Data Control and Processing with COBOL
EF 385 Cartography
EV 388 Physical Geology
EV 489 Individual Research Projects
MA 281 Vector Calculus and Differential Equations
MA 282 Differential Equations (Intermediate) and Probability Theory & Statistical Inference
MA 284 Complex Analysis and Probability Theory and Statistical Inference
MA 285 Vector Calculus and Complex Analysis
MA 286 Complex Analysis and Differential Equations
MA 481 Linear Programming
MA 482 Abstract Algebra
MA 483 Vector Calculus
MA 484 Differential Equations (Intermediate)
MA 485 Complex Analysis
MA 486 Numerical Analysis with Digital Computation
MA 487 Real Variable Theory
PH 383 Introduction to Theoretical Physics I
PH 384 Introduction to Theoretical Physics II
PH 483 Solid State Physics
PH 484 Quantum Mechanics
PH 486 Experimental Physics
PH 488 Nuclear Physics
PH 489 Special Topics in Physics

Chemistry Field

a. Elective Course List:

Principal

CH 383 Organic Chemistry I
CH 384 Organic Chemistry II
CH 481 Physical Chemistry I
CH 482 Physical Chemistry II
CH 485 Human Biology I
CH 486 Human Biology II
CH 489 Chemistry Research

Associated

EF 382 Computer Fundamentals
EV 385 Issues Confronting Man and His Environment
MA 483 Vector Calculus
MA 484 Differential Equations
MA 486 Numerical Analysis with Digital Computation
PH 483 Solid State Physics
PH 484 Quantum Mechanics
PH 488 Nuclear Physics

b. Elective courses required for credit for elective concentration in the Basic Science Area:
   1. Four Principal electives, *and*
   2. One course chosen from the combined lists of principal and associated electives.

Physics Field:

a. Elective Course List:

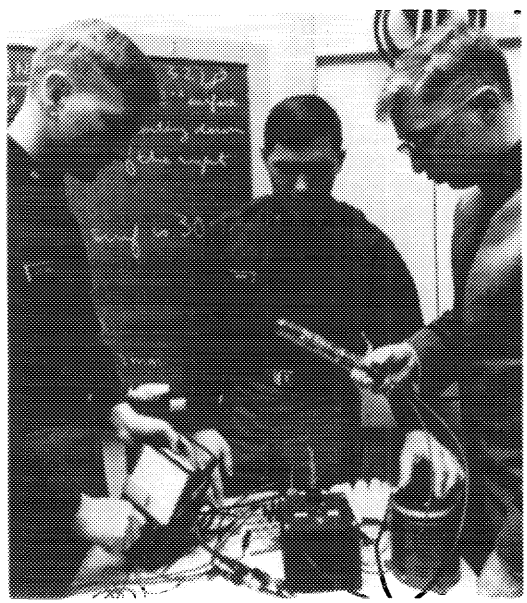
Principal

PH 383 Intro to Theoretical Physics I
PH 384 Intro to Theoretical Physics II
PH 483 Solid State Physics
PH 484 Quantum Mechanics
PH 486 Experimental Physics
PH 487 Nuclear Reactor Theory
PH 488 Nuclear Physics
PH 489 Special Topics in Physics

Associated

CE 453-454 Nuclear Engineering
EE 486 Solid State Electronics
EV 383 Space Sciences
MA 483 Vector Calculus
MA 484 Differential Equations (Intermediate)
MA 485 Complex Analysis
ME 483 Space Mechanics
OE 383 Engineering Materials

b. Elective courses required for credit for elective concentration in the Basic Science Area:
   1. Four principal electives, *and*
   2. One course selected from the combined lists of principal and associated electives.



Mathematics Field:

a. Elective Course List:

Principal

MA 281 Vector Calculus and Differential Equations
MA 282 Differential Eqns (Int) & Prob Theory & Stat Inference
MA 284 Complex Analysis and Prob Theory & Stat Inference
MA 285 Vector Calculus and Complex Analysis
MA 286 Complex Analysis and Differential Equations (Int)
MA 481 Linear Programming
MA 482 Abstract Algebra
MA 483 Vector Calculus
MA 484 Differential Equations (Int)
MA 485 Complex Analysis
MA 486 Numerical Analysis with Digital Comp
MA 487 Real Variable Theory

Associated

EE 483 Digital Computers
EE 484 Communications Systems
EF 382 Computer Science Fundamentals
EF 383 Data Control & Proc. with COBOL
EF 489 Individual Computer Sci Project
EV 383 Space Sciences
ME 483 Space Mechanics
ME 484 Aerospace Structures
ME 485 Continuum Mechanics
ME 486 Mechanical Vibrations
OE 385 Management Engineering
OE 487 Operations Research
PH 383 Intro to Theoretical Physics I
PH 384 Intro to Theoretical Physics II
PH 484 Quantum Mechanics

b. Elective courses required for credit for elective concentration in the Basic Science Area:
   1. Three principal electives, *and*
   2. Two courses chosen from the combined lists of principal and associated electives, or the Basic Science Courses, page V4.

APPLIED SCIENCE AND ENGINEERING AREA

Each cadet who elects to concentrate in the Applied Science and Engineering Area must satisfy the following requirements:

a. Complete a Core Program engineering sequence other than General Engineering.
b. Complete six elective courses selected as follows:
   1. Five selected from the Applied Science and Engineering Area list or five selected in accordance with the requirements of the Civil Engineering, Electrical Engineering, Engineering Mechanics, Nuclear Engineering or Weapon System Engineering field, *and*
   2. One selected from among the entire elective course offerings.

Applied Science and Engineering Area Elective Course List:

CE 381 Soil Mechanics
CE 382 Engineering of Environmental Systems
CE 481 Design of Concrete Structures
CE 482 Advanced Structural Analysis
CE 489 Individual Engineering Project
EE 382 Electromechanical Energy Conversion
EE 383 Electromagnetic Fields
EE 483 Digital Computer Systems
EE 484 Communication Systems
EE 485 Computer Engineering
EE 486 Solid State Electronics
EE 489 Adv Topics in Electrical Engineering
EF 382 Computer Science Fundamentals
EF 384 Principles of Surveying
EF 489 Individual Computer Science Projects
EV 383 Space Sciences
GE 381 Scientific Management
GE 383 Systems Engineering and Decision Making
ME 384 Mechanics of Materials
ME 387 Introduction to Applied Aerodynamics
ME 388 Aerodynamics of V/STOL Flight
ME 471 Aerospace Propulsion
ME 472 Direct Energy Conversion
ME 473 Experimental Mechanics
ME 481 Compressible Aerodynamics
ME 482 Heat Transfer
ME 483 Space Mechanics
ME 484 Aerospace Structures
ME 485 Continuum Mechanics
ME 486 Mechanical Vibrations
ME 488 Flight Mechanics
ME 489 Individual Mechanics Project
OE 383 Engineering Materials
OE 385 Management Engineering
OE 481 Automotive Engineering
OE 483 Helicopter Engineering
OE 487 Operations Research
PH 487 Nuclear Reactor Theory

Civil Engineering Field:

a. Elective Course List:

Principal

CE 381 Soil Mechanics
CE 382 Engineering of Environmental Systems
CE 481 Design of Concrete Structures
CE 482 Advanced Structural Analysis
CE 489 Individual Engr Project
EF 384 Principles of Surveying
GE 383 Systems of Engineering and Decision Making
ME 384 Mechanics of Materials
OE 385 Management Engineering

Associated

EF 382 Computer Science Fundamentals
EF 489 Individual Computer Science Project
EV 385 Issues Confronting Man & His Environment
EV 388 Physical Geology
GE 381 Scientific Management
MA 484 Differential Equations (Intermediate)
MA 486 Numerical Analysis with Digital Computation
ME 473 Experimental Mechanics

ME 484 Aerospace Structures
ME 485 Continuum Mechanics
ME 486 Mechanical Vibrations
OE 383 Engineering Materials

b. Courses required for credit for elective concentration in the Applied Science and Engineering Area:
   1. Four principal electives to include ME 384, *and*
   2. At least one additional course chosen from the combined lists of principal and associated electives.
   3. Cadets concentrating their electives in civil engineering must take CE 401-402 or CE 451-452 as their required engineering course sequence.

Electrical Engineering Field:

a. Elective Course List:

Principal

EE 382 Electromechanical Energy Conversion
EE 383 Electromagnetic Fields
EE 484 Communication Systems

Associated

EE 483 Digital Computer Systems
EE 485 Computer Engineering
EE 486 Solid State Electronics
EE 489 Advanced Topics in Elec Engr
EF 382 Computer Science Fundamentals
EF 489 Individual Computer Sci Project
EV 383 Space Sciences
MA 484 Differential Equations (Intermediate)
MA 485 Complex Analysis
MA 486 Numerical Analysis with Digital Computation
ME 472 Direct Energy Conversion
ME 486 Mechanical Vibrations
OE 383 Engineering Materials
PH 483 Solid State Physics
PH 484 Quantum Mechanics

b. Courses required for credit for elective concentration in the Applied Science and Engineering Area:
   1. All principal electives listed above, *and*
   2. At least two associated electives.
   3. Cadets concentrating their electives in electrical engineering must take EE 401-402 as their required engineering course sequence.

Engineering Mechanics Field:

a. Elective Course List:

Principal

ME 384 Mechanics of Materials
ME 387 Introduction to Applied Aerodynamics
ME 388 Aerodynamics of V/STOL Flight
ME 471 Aerospace Propulsion
ME 472 Direct Energy Conversion
ME 473 Experimental Mechanics
ME 481 Compressible Aerodynamics
ME 482 Heat Transfer
ME 483 Space Mechanics
ME 484 Aerospace Structures
ME 485 Continuum Mechanics
ME 486 Mechanical Vibrations
ME 488 Flight Mechanics
ME 489 Individual Mechanics Project

Associated

EE 402 Automatic Control Systems
EF 382 Computer Science Fundamentals
EV 383 Space Sciences
CE 381 Soil Mechanics
CE 481 Design of Concrete Structures
CE 482 Advanced Structural Analysis
MA 481 Linear Programming
MA 483 Vector Calculus
MA 485 Complex Analysis
MA 486 Numerical Analysis w/Digital Computation
OE 383 Engineering Materials
OE 481 Automotive Engineering
OE 483 Helicopter Engineering
PH 383 Introduction to Theoretical Physics I

b. Elective courses required for credit for elective concentration in the Applied Science and Engineering Area:
   1. Four principal electives, *and*
   2. At least one course chosen from the combined lists of principal and associated electives.

Nuclear Engineering Field:

a. Elective Course List:

Principal

EF 382 Computer Science Fundamentals
GE 383 Systems Engineering and Decision Making
MA 483 Vector Calculus
ME 384 Mechanics of Materials
ME 482 Heat Transfer
OE 383 Engineering Materials
PH 484 Quantum Mechanics
PH 487 Nuclear Reactor Theory
PH 488 Nuclear Physics

Associated

CE 382 Engineering of Environmental Systems
CE 489 Individual Engineering Project
EE 401 Electronic Circuits
EE 402 Automatic Control Systems
MA 484 Differential Equations (Intermediate)
MA 485 Complex Analysis
MA 486 Numerical Analysis with Digital Computation
PH 383 Introduction to Theoretical Physics I
PH 384 Introduction to Theoretical Physics II
PH 483 Solid State Physics
PH 486 Experimental Physics
PH 489 Special Topics in Physics

b. Courses required for elective concentration in Applied Science and Engineering Area:
   1. Four principal electives to include PH 487 *and*
   2. At least one course selected from the combined lists of principal and associated electives.
   3. Cadets concentrating their electives in Nuclear Engineering must take CE 453-454 as their required engineering sequence.

Weapons Systems Engineering Field:

a. Elective Course List:

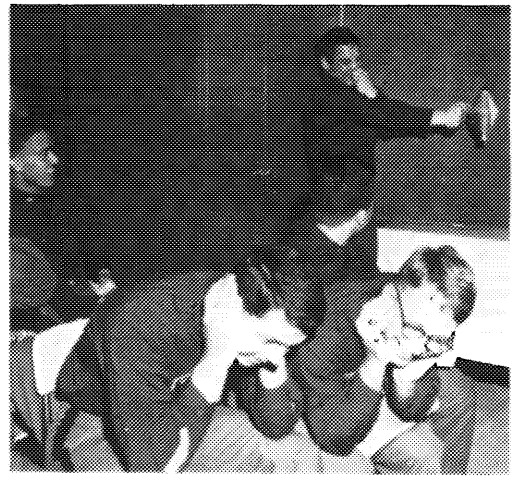
Principal

CE 489 Individual Engineering Project
GE 383 Systems Engr and Decision Making
MA 484 Differential Equations (Int)
ME 384 Mechanics of Materials
ME 388 Aerodynamics of V/STOL Flight
ME 483 Space Mechanics
ME 484 Aerospace Structures
ME 486 Mechanical Vibrations
OE 383 Engineering Materials
OE 385 Management Engineering
OE 481 Automotive Engineering
OE 483 Helicopter Engineering

Associated

EE 402 Automatic Control Systems
EF 382 Computer Science Fundamentals
GE 381 Scientific Management
MA 483 Vector Calculus
MA 486 Numerical Anal with Digital Comp
ME 387 Introduction to Applied Aerodynamics
ME 471 Aerospace Propulsion
ME 481 Compressible Aerodynamics
ME 482 Heat Transfer
ME 488 Flight Mechanics
OE 487 Operations Research
PL 481 Managerial Psychology

b. Courses required for credit for elective concentration in the Applied Science and Engineering Area:
   1. Three principal electives, *and*
   2. At least two courses selected from the combined lists of principal and associated electives.
   3. Cadets concentrating their electives in weapon systems engineering must take OE 401-402 or OE 451-452 as their required engineering course sequence.



HUMANITIES

Each cadet who elects to concentrate in the Humanities Area must satisfy the following requirements:

a. Complete GE 401-402 (cadets who so desire may substitute any other of the two-term engineering sequence for this requirement).
b. Complete eight elective courses selected as follows:
   1. Seven selected from the Humanities Area list, *or* seven selected in accordance with the requirements of the American Studies, Literature, or Language field, *and*
   2. One additional course selected from among the entire elective course offerings.

NOTE: Cadets who receive approval to concentrate their elective courses in Humanities may take elective courses in lieu of ME 302 and MA 206. Humanities concentrators electing this option will take MA 207 in lieu of MA 205. *Humanities Area Elective Course List:*

EN 381 English Literature from the Beginnings to 1660
EN 382 English Literature from 1660 to 1900
EN 383 Contemporary Literature
EN 384 American Literature of the Nineteenth Century
EN 391 Introduction to Fine Arts (overload only)
EN 392 Introduction to Music (overload only)
EN 481 The Novel
EN 482 Shakespeare
EN 483 Seminar in Aspects of American Culture
EN 485 Seminar in Major British Authors
EN 486 Seminar in Major American Authors
EN 487 American Studies: Expositors of 19th Century American Thought
EN 488 American Studies: Social Criticism in 20th Century American Prose
EN 489 Honors Course
LC 383 Chinese Literature and Culture I
LC 384 Chinese Literature and Culture II
LC 485 Readings in Modern Chinese
LC 486 Chinese Military Readings
LF 381 French Language through Literature
LF 382 Military and Scientific Readings in French
LF 483 History of French Civilization I
LF 484 History of French Civilization II
LF 485 Survey of French Literature
LF 486 Modern French Literature
LF 487 Directed Studies in French
LF 488 Directed Studies in French
LG 381 German Language through Literature
LG 382 Military & Scientific Readings in German
LG 483 History of German Civilization
LG 484 Contemporary Germany
LG 485 Survey of German Literature
LG 486 Modern German Literature
LG 487 Directed Studies in German
LG 488 Directed Studies in German
LP 381 Portuguese Language through Literature
LP 382 Survey of Brazilian Literature
LP 383 Military Readings in Portuguese
LP 485 Directed Studies in Portuguese
LP 486 Directed Studies in Portuguese
LR 381 Advanced Russian Language
LR 382 Russian Language through Literature
LR 483 Russian and Soviet Civilization
LR 474 Soviet Russian Literature
LR 475 Military & Scientific Readings in Russian
LR 476 Soviet Expository Writings
LS 381 Spanish Language through Literature
LS 382 Military Readings in Spanish
LS 483 Survey of Spanish-American Literature
LS 484 Modern Spanish-American Literature
LS 485 Survey of Spanish Literature
LS 486 Modern Spanish Literature
LS 487 Directed Studies in Spanish
LS 488 Directed Studies in Spanish

American Studies Field:

(American Thought and Civilization)

a. Elective Course List:

Principal

EN 384 Am Lit of the 19th Century
EN 483 Seminars in Aspects of American Culture
EN 487 Am Studies: Expositors of 19th Century Am Thought
EN 488 Am Studies: Social Criticism in 20th Century Prose
EN 489 Honors Course
EV 384 Regional Geography of the United States
HI 373 Topics in American History
PL 484 Military Institutions of U.S.
SS 387 Seminar in Public Policy

Associated

EN 383 Contemporary Literature
EN 391 Introduction to Fine Arts (overload only)
EN 392 Introduction to Music (overload only)
EN 486 Seminar in Major American Authors
HI 372 History of U.S. For Rels
HI 383 20th Century Warfare
HI 481 Seminar in History
LW 481 International Law
LW 482 Seminar: Mil Aspects of Int'l Law
PL 482 Sociology: Society and Culture
SS 386 Political Philosophy
SS 483 National Security Seminar

b. Elective courses required for credit for elective concentration in the Humanities Area:
   1. Four principal electives to include EN 487 and EN 488, and one other seminar.
   2. Three other courses selected from the combined list of principal and associated electives.

Literature Field:

a. Elective Course List:

Principal

EN 381 English Literature from the Beginnings to 1660
EN 382 English Literature from 1660 to 1900
EN 383 Contemporary Literature
EN 384 American Literature of the 19th Century
EN 481 The Novel
EN 482 Shakespeare
EN 485 Seminar in Major British Authors
EN 486 Seminar in Major American Authors
EN 488 American Studies: Modern American Criticism
EN 489 Honors Course

Associated

EN 391 Introduction to Fine Arts (Overload only)
EN 392 Introduction to Music (Overload only)
EN 483 Seminar in Aspects of American Culture
EN 487 American Studies: Expositors of 19th Century American Thought
HI 373 Topics in American History
HI 374 Topics in European History
HI 481 Seminar in History
PL 482 Sociology: Society and Culture
SS 386 Political Philosophy

Any foreign language courses in the 300 or 400 series for which the individual is qualified.

b. Elective courses required for credit for elective concentration in the Literature Field of the Humanities Area:

   At least three of the following courses:
   EN 381, EN 382, EN 384, EN 482.

   plus

   At least two additional courses chosen from the list of principal courses.

   plus

   At least two additional courses chosen from the combined lists of principal and associated courses.

   (Depending on the cadet's literary background and special interest, the above criteria may be adjusted, but only with the consent of the Head of the Department of English or his authorized representative.)

Chinese Language Field:

a. Elective Course List:

Principal

EV 382 Geography of Communist China
LC 383 Chinese Literature and Culture I
LC 384 Chinese Literature and Culture II
LC 485 Readings in Modern China
LC 486 Chinese Military Readings

Any English course in the 300 or 400 series except EN 391 and EN 392.

Associated

EN 391 Intro to Fine Arts (overload only)
EN 392 Intro to Music (overload only)
HI 381 Revolutionary Warfare
LW 481 International Law

LW 482 Seminar in Mil Aspects of Int'l Law
PL 482 Sociology: Society and Culture
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 471 Major Political Systems of East Asia
SS 476 Internat'l Affairs: Theory and Applications
SS 484 International Economics
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

b. Elective courses required for credit for elective concentration in the Humanities Area:
   1. Four principal electives to include three LC courses, *and*
   2. At least three courses selected from the combined lists of principal and associated electives.

French Language Field:

a. Elective Course List:

Principal

LF 381 French Language through Literature
LF 382 Military & Scientific Readings in French
LF 483 History of French Civilization I
LF 484 History of French Civilization II
LF 485 Survey of French Literature
LF 486 Modern French Literature
LF 487 Directed Studies in French
LF 488 Directed Studies in French

Any English elective in the 300 or 400 series, except EN 391 and EN 392.

Associated

EN 391 Intro to Fine Arts (overload only)
EN 392 Intro to Music (overload only)
HI 374 Topics in European History
HI 381 Revolutionary Warfare
HI 481 Seminar in History
HI 489 Individual History Project (On French Topic)
LW 481 International Law
LW 482 Seminar in Mil Aspects of Int'l Law
PL 482 Sociology: Society & Culture
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 476 International Affairs: Theory and Applications
SS 484 International Economics
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

b. Elective courses required for credit for elective concentration in the Humanities Area:
   1. Five principal electives to include four LF courses, *and*
   2. At least two courses selected from the combined lists of principal and associated electives.

German Language Field:

a. Elective Course List:

Principal

LG 381 German Language thru Lit
LG 382 Military & Scientific Readings in German
LG 483 History of German Civilization
LG 484 Contemporary Germany
LG 485 Survey of German Literature
LG 486 Modern German Literature
LG 487 Directed Studies in German
LG 488 Directed Studies in German

Any English elective in the 300 or 400 series, except EN 391 and EN 392.

Associated

EN 391 Intro to Fine Arts (overload only)
EN 392 Intro to Music (overload only)
HI 374 Topics in European History
HI 481 Seminar in History
HI 489 Individual History Project (On German Topic)
LW 481 International Law
LW 482 Seminar in Mil Aspects of Int'l Law
PL 482 Sociology: Society & Culture
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 476 Internat'l Affairs: Theory & Applications
SS 484 International Economics
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

b. Elective courses required for credit for elective concentration in the Humanities Area:
   1. Five principal electives to include four LG courses, *and*
   2. At least two courses selected from the combined list of principal and associated electives.

Portuguese Language Field:

a. Elective Course List:

Principal

LP 381 Portuguese Language through Literature
LP 382 Survey of Brazilian Literature
LP 383 Military Readings in Portuguese
LP 485 Directed Studies in Portuguese
LP 486 Directed Studies in Portuguese
SS 384 Government and Politics of Latin America
Any English elective in the 300 or 400 series, except EN 391 and EN 392.

Associated

EN 391 Intro to Fine Arts (overload only)
EN 392 Intro to Music (overload only)
HI 374 Topics in European History
HI 481 Seminar in History
HI 489 Individual History Project (On Portuguese or Brazilian Topic)
LW 481 International Law
LW 482 Seminar in Mil Aspects of Int'l Law
PL 482 Sociology: Society and Culture
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 476 International Affairs: Theory and Applications
SS 484 International Economics
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

b. Elective courses required for credit for elective concentration in the Humanities Area:
   1. Five principal electives to include four LP courses, *and*
   2. At least two courses selected from the combined lists of principal and associated electives.

Russian Language Field:

a. Elective Course List:

Principal

EV 381 Geography of USSR
HI 371 History of Russia
LR 381 Advanced Russian Language
LR 382 Russian Language through Literature
LR 473 Russian and Soviet Civilization
LR 474 Soviet Russian Literature
LR 475 Military & Scientific Readings in Russian
LR 476 Soviet Expository Writings
SS 475 Government and Politics of the USSR

Any English course in the 300 or 400 series, except EN 391 and EN 392.

Associated

EN 391 Intro to Fine Arts (overload only)
EN 392 Intro to Music (overload only)
HI 374 Topics in European History
HI 381 Revolutionary Warfare
HI 481 Seminar in History
HI 489 Individual History Project (on Russian topic)
LW 481 International Law
LW 482 Seminar in Mil Aspects of Int'l Law
PL 482 Sociology: Society and Culture
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 476 Internat'l Affairs: Theory and Applications
SS 484 International Economics
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

b. Elective courses required for credit for elective concentration in the Humanities Area:
   1. Five principal electives to include for four LR courses, *and*
   2. At least two electives selected from the combined lists of principal and associated electives.

Spanish Language Field:

a. Elective Course List:

Principal

LS 381 Spanish Language through Lit
LS 382 Military Readings in Spanish
LS 483 Survey of Spanish-Amer Lit
LS 484 Modern Spanish-Amer Lit
LS 485 Survey of Spanish Literature
LS 486 Modern Spanish Literature
LS 487 Directed Studies in Spanish
LS 488 Directed Studies in Spanish
SS 384 Government and Politics of Latin America

Any English elective in the 300 or 400 series, except EN 391 and EN 392.

Associated

EN 391 Intro to Fine Arts (overload only)
EN 392 Intro to Music (overload only)
HI 374 Topics in European History
HI 381 Revolutionary Warfare
HI 481 Seminar in History
HI 489 Individual History Project (On Spanish or Latin American Topic)
LW 481 International Law
LW 482 Seminar in Mil Aspects of Int'l Law
PL 482 Sociology: Society and Culture
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 476 Internat'l Affairs: Theory and Applications
SS 484 International Economics and Economic Development
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

b. Elective courses required for credit for elective concentration in the Humanities Area:
   1. Five principal electives to include four LS courses, *and*
   2. At least two courses selected from the combined lists of principal and associated electives.

NATIONAL SECURITY AND PUBLIC AFFAIRS AREA

Each cadet who elects to concentrate in the National Security and Public Affairs area must satisfy the following requirements:

a. Complete GE 401-402 (cadets who so desire may substitute any other two-term engineering sequence for this requirement).
b. Complete eight elective courses selected as follows:
   1. Seven selected from the National Security and Public Affairs area *or* seven selected in accordance with the requirements of the Economics, History, International Affairs, Military Studies, or Political Science Field, *and*
   2. One selected from among the entire elective course offerings.

NOTE: Cadets who receive approval to concentrate their elective courses in National Security and Public Affairs may take elective courses in lieu of ME 302 and MA 206. NSPA concentrators electing this option will take MA 207 in lieu of MA 205.

National Security and Public Affairs Elective Course List:

EV 381 Geography of the USSR
EV 382 Geography of Communist China
EV 384 Regional Geography of the U.S.
EV 385 Issues Confronting Man and His Environment
HI 371 History of Russia
HI 372 History of U. S. Foreign Relations
HI 373 Topics in American History
HI 374 Topics in European History
HI 381 Revolutionary Warfare
HI 383 Twentieth Century Warfare
HI 384 Topics in Military History
HI 481 Seminar in History
HI 489 Individual History Project
LW 481 International Law
LW 482 Seminar in Military Aspects of International Law
PL 481 Managerial Psychology
PL 482 Sociology: Society and Culture
PL 483 Social Psychology
PL 484 Military Institutions of U.S.
PL 485 Behavioral Science Research
PL 486 Organization Theory

SS 372 Policy and Administration
SS 373 Quantitative Analysis in the Social Sciences
SS 383 Middle Eastern Studies
SS 384 Government and Politics of Latin America
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 387 Seminar in Public Policy
SS 388 Macroeconomics
SS 389 Managerial Economics
SS 471 Major Political Systems of East Asia
SS 475 Government and Politics of the Soviet Union
SS 476 International Affairs: Theory and Applications
SS 482 Microeconomics: Theory and Applications
SS 483 National Security Seminar
SS 484 International Economics and Economic Development
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology
SS 487 Public Policy Decision-making and Debate
SS 489 Individual Social Sciences Project

Economics Field:

a. Elective Course List:

Principal

SS 373 Quantitative Analysis in the Social Sciences
SS 385 Comparative Economic Systems
SS 388 Macroeconomics
SS 389 Managerial Economics
SS 482 Microeconomics: Theory and Applications
SS 484 International Economics and Economic Development

Associated

EF 382 Computer Science Fundamentals
EN 483 Seminar in Aspects of American Culture
EV 385 Issues Confronting Man and His Environment
GE 381 Scientific Management
GE 383 Systems Engineering and Decision Making
HI 373 Topics in American History (when economic history
MA 481 Linear Programming
OE 385 Management Engineering
OE 487 Operations Research
PL 481 Managerial Psychology
PL 482 Sociology
PL 483 Social Psychology
PL 486 Organization Theory
SS 372 Policy and Administration
SS 387 Seminar in Public Policy
SS 483 National Security Seminar
SS 485 Problems of the Developing Nations
SS 487 Public Policy Decision-Making and Debate
SS 489 Individual Social Sciences Project

b. Elective Courses required for credit for elective concentration in the National Security and Public Affairs Area

1. Five principal electives to include SS 373, SS 388, and SS 482 *and*
2. At least two courses selected from the combined lists of principal and associated electives.
3. One of two principal electives required but not specified in para bl may be satisfied by retaining the third class Mathematics sequence MA 205-206.

History Field:

a. Elective Course List

Principal

HI 371 History of Russia
HI 372 History of U.S. Foreign Relations
HI 373 Topics in American History
HI 374 Topics in European History
HI 381 Revolutionary Warfare
HI 383 Twentieth Century Warfare
HI 384 Topics in Military History
HI 481 Seminar in History
HI 489 Individual History Project

Associated

EN 382 English Lit. from 1660 to 1900
EN 384 American Lit. of the 19th Century
EN 391 Intro to Fine Arts (overload only)
EN 483 Seminars in Aspects of American Culture
EN 487 Am. Studies: Expositors of 19th Century American Thought
EN 488 Social Criticism in 20th Century American Prose

EN 489 Honors Course
L —— Any Foreign Language elective course using historical materials
LW 481 International Law
LW 482 Seminar in Military Aspects of International Law
PL 482 Sociology: Society and Culture
PL 483 Social Psychology
SS 372 Policy and Administration
SS 383 Middle Eastern Studies
SS 384 Government and Politics of Latin America
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 471 Political Systems of East Asia
SS 483 National Security Seminar
SS 486 Political and Cultural Anthropology

b. Elective courses required for credit for elective concentration in the National Security and Public Affairs Area:
   1. Four principal electives to include HI 481 or HI 489, *and*
   2. At least there courses selected from the combined lists of principal and associated electives.

International Affairs Field:

a. Elective Course List:

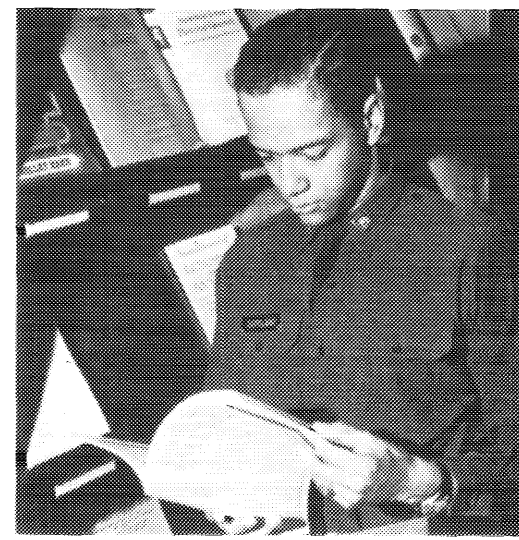
Principal

HI 372 History of U.S. Foreign Relations
LW 481 International Law
SS 373 Quantitative Analysis in the Social Sciences
SS 471 Major Political Systems of East Asia
SS 476 International Affairs: Theory and Applications
SS 483 National Security Seminar
SS 484 International Economics and Economic Development
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

Associated

EV 381 Geography of the USSR
EV 382 Geography of Communist China
HI 372 History of Russia
HI 373 Topics in American History
HI 374 Topics in European History
HI 381 Revolutionary Warfare
HI 383 Twentieth Century Warfare
HI 384 Topics in Military History
HI 481 Seminar in History
HI 489 Individual History Project
L —— Elective Language Course (300 or 400 series)
LW 482 Seminar in Military Aspects of International Law
PL 482 Sociology: Society and Culture
PL 483 Social Psychology
PL 484 Military Institutions of U.S.
SS 383 Middle Eastern Studies
SS 384 Government and Politics of Latin America
SS 385 Comparative Economic Systems
SS 386 Political Philosophy
SS 475 Government and Politics of the Soviet Union
SS 487 Public Policy Decision-Making and Debate
SS 489 Individual Social Sciences Project

b. Elective courses required for credit for elective concentration in the National Security and Public Affairs Area:
   1. Five principal electives to include HI 372, LW 481, and SS 483, *and*
   2. At least two courses chosen from the combined lists of principal and associated electives. Only one associated language elective may be selected in fulfillment of this requirement.



Military Studies Field:

a. Elective Course List:

Principal

HI 381 Revolutionary Warfare
HI 383 20th Century Warfare
HI 384 Topics in Military History
HI 481 Seminar in History (on Militarily-related topic)
HI 489 Individual History Project
PL 482 Sociology: Society & Culture
PL 484 Military Institutions of U.S.
SS 483 National Security Seminar

Associated

HI 372 History of U.S. Foreign Relations
HI 373 Topics in American History (on militarily-related topic)
HI 374 Topics in European History (on militarily related topic)
L —— Any Foreign Language elective course in military readings
LW 481 International Law
LW 482 Seminar in Military Aspects of International Law
PL 483 Social Psychology
PL 486 Organization Theory
SS 482 Microeconomics: Theory and Application
SS 485 Problems of Developing Nations

b. Elective courses required for credit for elective concentration in the National Security and Public Affairs Area:
   1. Four principal electives to include HI 383 and either HI 381 or HI 384, *and*
   2. At least three courses selected from the combined lists of principal and associated electives.

Political Science Field:

a. Elective Course List:

Principal

PL 486 Organization Theory
SS 372 Policy and Administration
SS 373 Quantitative Analysis in the Social Sciences
SS 386 Political Philosophy
SS 387 Seminar in Public Policy
SS 475 Government and Politics of the Soviet Union
SS 483 National Security Seminar
SS 485 Problems of Developing Nations
SS 486 Political and Cultural Anthropology

Associated

EN 483 Seminar in Aspects of American Culture
EN 385 Issues Confronting Man and His Environment
HI 371 History of Russia
HI 372 History of U.S. Foreign Relations
HI 373 Topics in American History
HI 374 Topics in European History
HI 381 Revolutionary Warfare
HI 383 Twentieth Century Warfare
HI 384 Topics in Military History
HI 481 Seminar in History
HI 489 Individual History Project
LW 481 International Law
PL 482 Sociology: Society and Culture
PL 483 Social Psychology
PL 484 Military Institutions of U.S.
SS 383 Middle Eastern Studies
SS 384 Government and Politics of Latin America
SS 385 Comparative Economic Systems
SS 388 Macroeconomics
SS 471 Major Political Systems of East Asia
SS 476 Internat'l Affairs: Theory & Applns
SS 482 Microeconomics: Theory & Applns
SS 484 Internat'l Economics and Economic Development
SS 487 Public Policy Decision-Making and Debate
SS 489 Individual Social Sciences Project

b. Elective courses required for credit for elective concentration in the National Security and Public Affairs Area:
   1. Five principal electives to include SS 372, SS 386, and SS 387 *and*
   2. At least two courses selected from the combined lists of principal and associated electives.

INTERDISCIPLINARY FIELD OF STUDY
(Not Associated with an Area of Concentration)

Management Field:

a. Elective Course List:

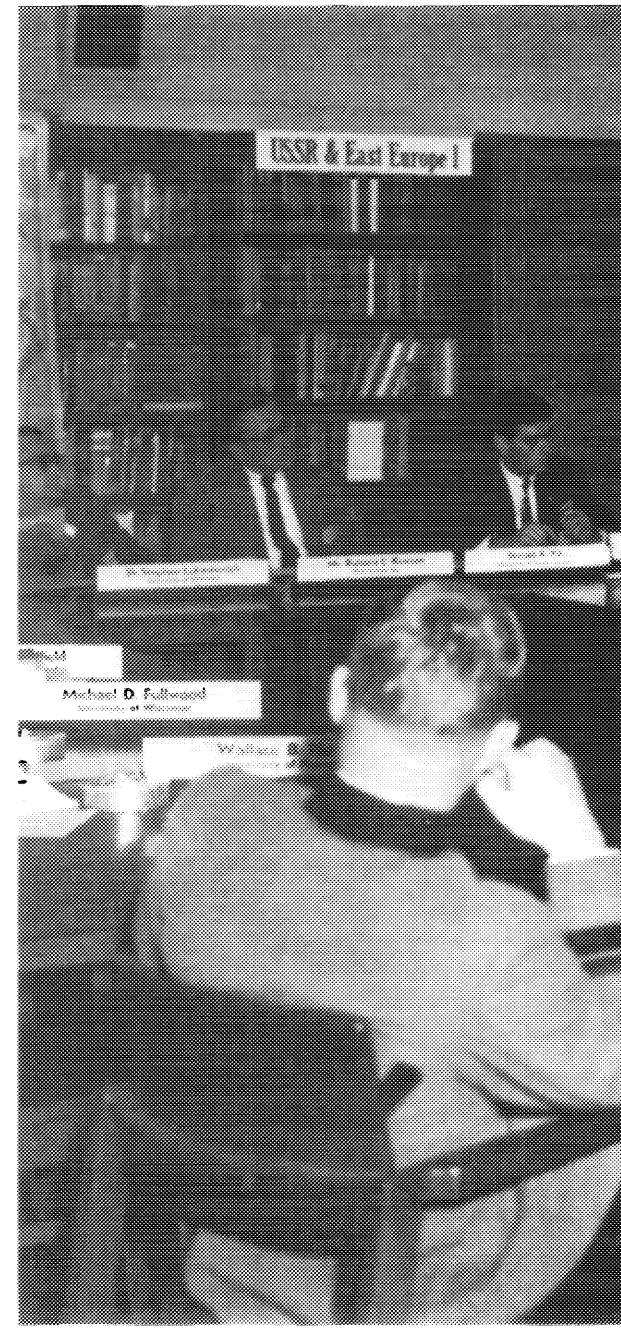
Principal

EF	382	Computer Science Fundamentals
EF	383	Data Control and Processing with COBOL
GE	381	Scientific Management
GE	383	Systems Engr and Decision-Making
MA	481	Linear Programming
OE	385	Management Engineering
OE	487	Operations Research
PL	481	Managerial Psychology
PL	486	Organization Theory
SS	373	Quantitative Analysis in the Social Sciences
SS	389	Managerial Economics
SS	482	Microeconomics: Theory and Applications

Associated

MA	486	Numerical Anal with Digital Comp
PL	482	Sociology: Society and Culture
PL	483	Social Psychology
PL	484	Military Institutions of U.S.
SS	372	Policy and Administration
SS	489	Individual Social Sciences Project

b. A cadet who wishes to obtain the maximum benefits from the courses offered in this field should select his six electives as follows:
   1. GE 381 Scientific Management
   2. PL 486 Organization Theory *or*
      PL 481 Managerial Psychology
   3. OE 385 Management Engineering *or*
      OE 487 Operations Research
   4. SS 482 Microeconomics: Theory and Applications *or*
      SS 389 Managerial Economics
   5. Free choice from among the combined lists of principal and associated electives.
   6. Free choice from among all electives.



Lecture Program

Lectures sponsored by the various activities at the Military Academy are coordinated by the Dean of the Academic Board. In almost every case the lecture is an integral part of the course of instruction of the attending class or classes.

The following is a representative grouping of lectures presented to the Corps of Cadets under the sponsorship of the Departments of Instruction indicated.

Department of Earth, Space and Graphic Sciences

Astronauts David R. Scott and Alfred H. Worden,
NASA Manned Space Program,
"Apollo 15: Exploration of Hadley Rille"

MG Richard H. Groves,
Division Engineer of the North Atlantic Division,
Office of the Chief of Engineers,
"Role of the Corps of Engineers in Preserving the Environment"

Dr. George Hoffman,
Professor of Geography, University of Texas,
"Eastern Europe"

Russell E. Train,
Chairman, Council on Environmental Quality,
"United States Government in Environmental Policies"

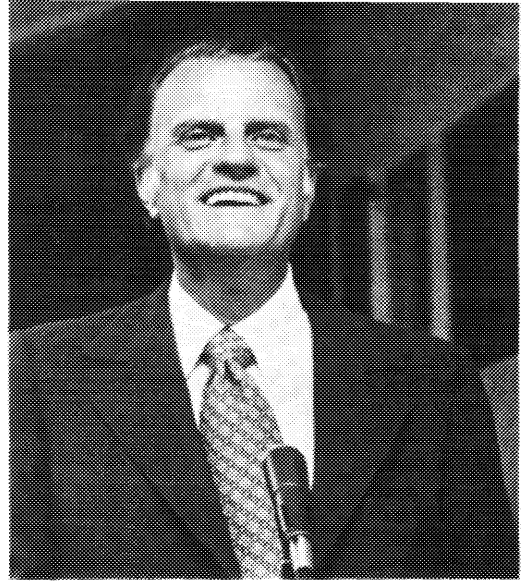
BG Albert B. Crawford, Jr.,
Head of the Office of the Project Manager of the Army Tactical Data Systems,
"Role of Computers in the Military Operations"

Dr. John E. Fox,
Professor of Geography, Trenton State University,
"Stellar Observations"

Mr. Clifford D. Stewart,
architect and partner of the firm,
Perry, Dean and Stewart, Boston, Massachusetts,
"Computers and Architecture"

Dr. Marvin Wofsey,
Professor of Computer Science,
George Washington University,
"Role of Computers in the Business World"

Dr. Kemble Widmer,
State Geologist of New Jersey,
"West Point and the Ice Age"



MAJ Gordon J. Bratz,
Assistant Professor of English, USMA,
"American Writers and the American Environment"

Department of Engineering

Mr. Richard C. Maguire,
R & E Direcorate, USAWECOM,
"The U.S. Army Small Arms Program"

Mr. John Meyer, Sverdrup and Parcel,
Architects and Engineers,
"Architectural-Engineering Interaction"

Mr. Marty Chase, Engineer,
U.S. Army Selected Ammunition Project Office, USAMC, "Engineering for Productivity and Reliability"

Mr. Joseph B. Hayes,
Chief Engineer, U.S. Army Tank-Automotive Command, "Weapon Systems Design"

Dr. Edward Teller,
Associate Director, Lawrence Radiation Laboratory, University of California,
"The Role of Engineering in our National Security"

LTC Robert LaFrenz,
Director, USA Explosive Excavation Research Agency, "Nuclear Cratering, the Army's Role in Peaceful Uses of Atomic Energy"

Dr. Willima T. Morris,
Chairman, Department of Industrial Engineering,
Ohio State University,
"The Decision Maker and the Analyst"

Melvin Grosz,
Vice President, Esso Mathematics and Systems Inc., "Models for Management"
Brigadier General Winfield S. Scott,
Commandant Defense Systems Management School, "What is Important in Management"

Department of Electrical Engineering
MG Hugh F. Foster, Jr.,
Commanding General, USAECOM,
Ft. Monmouth, New Jersey,
"Communications and Electronics in the Army"

Department of English
Dr. William T. H. Jackson, Professor,
Department of Germanic Languages,
Columbia University,
"Chaucer: The Universal and The Particular"
Dr. Arthur H. Scouten, Professor,
Department of English, University of Pennsylvania,
"*Gulliver's Travels:* The Assault on Man's Pride"
Mr. John Ciardi, Poetry Editor,
Saturday Review,
"Poetry is a Way of Knowing"
Mr. Howard Nemerov, Poet,
"The Nature of Modern Poetry"
Dr. Hugh Holman, Professor of English,
University of North Carolina,
"Aspects of American Literature"
Dr. Terrence Martin, Professor of English,
Indiana University,
"American Attitudes Toward Experience"
Mr. Christopher Martin, Director,
CSC Repertory Company,
"The Dramatic Element in Fiction"
Dr. John Seelye, Professor of English,
University of Connecticut,
"Aspects of the Novel: *Billy Budd*"
Dr. James Meriwether, Professor of English,
University of South Carolina,
"The Novels of William Faulkner"
Dr. Robert H. Gurland, Professor,
Department of Philosophy,
New York University,
"The Ghost and the Machine—
Cartesian Dualism"
Dr. Arthur C. Danto, Professor,
Department of Philosophy, Columbia University,
"The Philosophy of Hume"
Dr. Charles Frankel, Old Dominion Professor
of Philosophy and Public Affairs,
Columbia University,
"Logical Positivism and Existentialism"
Dr. Daniel Serra-Badue, Chairman,
Department of Art History, St. Peter's College,
"Art and the Military"
Dr. Bernard Boyd, Chairman,
Department of Religion,
University of North Carolina,
"Archeology in the Holy Lands"
Professor Gabor Peterdi, Professor of Printmaking,
Yale University, "The Art of Graphic Arts"
Mme Rodo-Boulanger, Artist,
Paris, France, "Graphic Arts in France"
Michael Goudket, Art Department,
Columbia Teacher's College,
"The Art of Photography"
Ray Harm, Wildlife Artist,
"Wildlife Artistry from Sketch to Art"
Mr. Johnnny Friedlaender, Director,
Atelier-Friedlaender,
"The Refinements of Graphic Arts Techniques"
Mr. Kaiko Moti, Academy of Florence,
"Development of the Artist"
Mr. Barry Baron, Adjunct Lecturer,
Department of Art, City College of New York,
"Modern Sculpture"
Miss Margery Tomchuck, Artist,
New York City,
"Woodblock and Intaglio Graphics"
Mr. Bruce Yarnell, Baritone,
San Francisco Opera,
"The Art of the Singing Actor"
Mr. Gene Feist, Director,
Roundabout Theatre,
"Chekhov and the Russian Theatre"
Mr. Holmes Easley, Set Designer,
Roundabout Theatre,
"The Stage and the Visual Metaphor"
Mr. Hillard Elkins and Miss Clair Bloom (Elkins),
Producer, Elkins Corporation, "The Theatre"

Department of Foreign Languages
Dr. Humberto Piñera, Professor of Spanish,
New York University,
"El teatro moderno en España"
German Army Attaché, "Die Bundeswehr in der Nato"

Mr. Jean-Claude Martin, Professor of French,
Brooklyn College. "Comparison of
Educational Systems: U.S.A. and France"
Mr. Parker Po-fei Huang, Professor,
Far East Institute, Yale University,
"Communist Language Reform"

Department of History
COL John E. Jessup Jr.,
Office of the Chief of Military History,
"The Origins of the East Slavs"
Rt. Rev. Monsignor Edward J. Sutfin,
Chairman, Department of Fine Arts, Philosophy
and Religion, Norwich University,
"The Art of the Renaissance"
Mr. Boris Todorovich,
"Yugoslav and French Resistance Movements
in World War II"
Dr. Jay Luvaas,
Professor of History, Allegheny College, Pa.,
"European Military Theorists"
Dr. J. M. W. Bean,
Professor of History, Columbia University,
"The Tudor-Stuart Constitution"
Dr. Russell Weigley,
Professor of History, Temple University,
"American Military Policy"
Dr. Kenneth Jackson,
Professor of History, Columbia University,
"The American City"
Dr. Trumbull Higgins,
Professor of History, CUNY,
"Coalition Warfare in World War II"
MG(Ret) Edward G. Lansdale,
"The Insurgency of the Hukbalahap"
Dr. Forrest Pogue,
George C. Marshall Research Institute,
"World War II Command and Strategy"
Tran Van Dinh,
Temple University,
"Dien Bien Phu and the Vietminh"
Dr. Donald G. Gillin,
Professor of History, Vassar College,
"The Chinese Civil War 1945-49"

Department of Law
MG George S. Prugh,
The Judge Advocate General of the Army,
"Military Law and the Young Commander"
Professor Joseph W. Bishop, Jr.,
Richard Ely Professor of Law, Yale University Law
School,
"Jurisdictional Aspects of the Laws of War"

Department of Mathematics
Dr. Seth Bonder,
Associate Professor,
Department of Industrial Engineering,
University of Michigan,
"Mathematical Modeling of Conflict"

Department of Mechanics
Mr. Michael Kornitzky,
Army Materials and Mechanics Research Center,
Watertown, Mass.,
"Modern Structural Materials"
Richard L. Kline,
Managing Engr, Space Shuttle Program,
Grumman Aerospace Corporation,
"Space Shuttle Structures"
Professor J. C. DenHartog,
Professor of Mechanical Engineering,
Mass. Institute of Technology,
"Mechanical Vibrations"
Professor Arthur E. Bergles,
Professor of Mechanical Engineering,
Georgia Tech.,
"Boiling Heat Transfer"
Professor Verne L. Roberts,
Head, Biosciences Division,
University of Michigan,
"Biomechanics"
Messrs. John Ingraham and Ralph Papirno,
Army Materials and Mechanics Research Center,
Watertown, Mass.,
"Modern Structural Materials"
COL Frank Borman (Ret),
Vice President, Eastern Air Lines,
"Applications of Mechanics in Space"
Mr. Ted Drzewiecki,
Chief, Fliudics Systems Development Branch,
Harry Diamond Laboratories, Washington, D.C.,
"Thinking with Air"
Dr. Robert H. Cannon,
Assistant Secretary for Research and Technology,
Department of Transportation,
"Mass Transportation—A Forward Look"

Department of Social Sciences

Dr. Graham Allison,
Professor of Government, Harvard University,
"Policy Models"

Hon. Kenneth E. Belieu,
Undersecretary of the Army,
"The Army and Congress"

Rev. Walter Cizek,
Professor of Russian Studies, Fordham University,
"Life in the Soviet Union"

Dr. Stewart Fagan,
Professor of Political Science,
Columbia University,
"Foreign Investment in Latin America"

Dr. Robert O. Freedman,
Professor of Political Science,
Marquette University,
"The Zionist Viewpoint in the Arab-Israeli Dispute"

Hon. Robert F. Froehlke,
Secretary of the Army,
"The Army in the 1970's"

B. G. Alexander Haig,
Deputy Assistant to the President
for National Security Affairs,
"Decision-making in the Nixon Administration"

Mr. David Kershaw,
Project Director, *Mathematica*,
"Poverty and the Negative Income Tax"

Colonel Anthony King-Harmon and
Lieutenant Colonel Andre Houel,
NATO International Staff,
"NATO in the 1970's"

Mr. Jan Lodal,
Vice President,
American Management Systems, Inc.,
and Mr. John Seidl,
Deputy Assistant Secretary, H.E.W.,
"Reform in the Department of Health,
Education, and Welfare"

Dr. John D. Martz,
Professor of Political Science,
University of North Carolina,
"Political Development in Latin America"

Mr. Clay E. McManaway,
Deputy Assistant Secretary of Defense
(Systems Analysis),
and Colonel Donald E. Bletz,
Staff and Faculty, Army War College,
"The U.S. Army and Insurgency"

Dr. Margaret Mead,
American Museum of Natural History,
"Anthropology"

Dr. Felix Moos,
Professor of Anthropology, University of Kansas,
"Rice Paddies and Anthropology:
A Different Look at East Asia"

Dr. Abdul A. Said,
Professor of International Relations,
the American University,
"Palestinians: Problems and Prospects"

Dr. Warner Schilling,
Professor of Political Science,
Columbia University,
"The Strategy of Sufficiency"

Mr. William C. Sullivan,
former Assistant Director of the FBI,
"Bureaucratic Politics"

Mr. John P. Vann,
Director, 2nd Regional Advisor Group, RVN,
"Vietnamization: A Report"

Dr. Hisham Sharabi,
Professor of Government, Georgetown University,
"Palestinian Guerrilla Movements"

Dr. K. Wayne Smith,
Director of Program Analysis,
National Security Council,
"Strategies for the Seventies"

Dr. Alfred Stepan,
Professor of Civil-Military Relations,
Yale University,
"Military Regimes in Developing Nations"

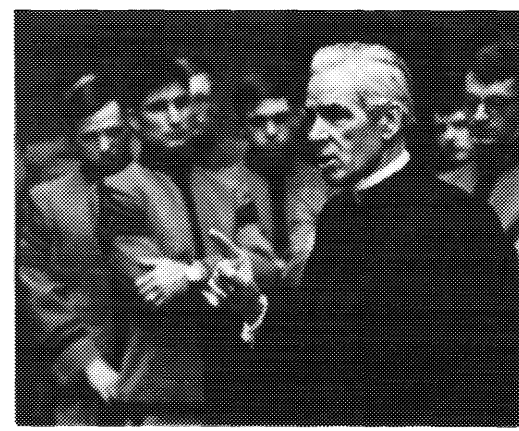
Dr. Robert Wilburn,
Office of the Assistant Secretary of Defense (Systems Analysis),
"The DOD Budget and the U.S. Fiscal Policy"
Dr. John Wilson,
Staff Economist, Federal Power Commission,
"The Structure of the U.S. Economy"
Professor Paul N. Ylvisaker,
Professor of Public Affairs and Urban Planning, Princeton University,
"Intergovernmental Relations and the Urban Crisis"

Office of Military Psychology and Leadership

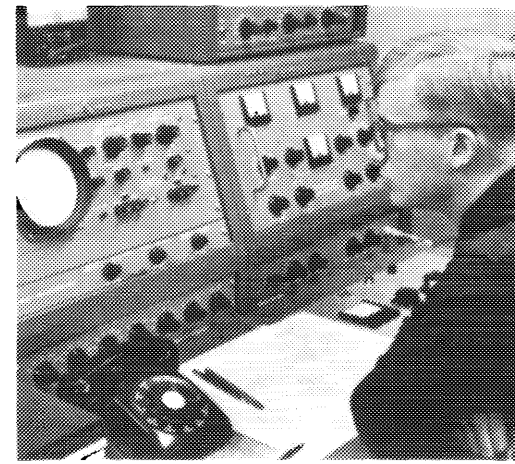
Congressman Ronald V. Dellums,
7th District, California,
"The Politics of the Niggers"
Mr. Daniel Henkin,
Assistant Secretary of Defense for Public Affairs,
"Pentagon Public Affairs Activities"
LTG Joseph G. Heiser,
DCSLOG, Department of the Army,
"Logistics Leadership"
LTG Melvin Zais,
Director, J-3, Operations Directorate,
"The Leadership Challenge"
Colonel Victor F. Phillips,
U.S. Air Force Academy,
"Organizational Role of the Assistant-to"
Mr. Joe Clark,
International Meditation Society,
"Transcendental Meditation"
Mr. Ned Coll,
National Director of the Revitalization Corps,
"Volunteer Work in the Inner City"
Dr. Fred E. Fiedler,
University of Washington,
"Leadership Contingency Model"
Mr. John Hart,
CBS News,
"Responsibilities of the News Media for Reporting on Military Affairs"
Mr. Kenneth O. Michel,
Director, Management Development Programs, General Electric Company,
"Management Development"
Mr. Frank Natale,
Phoenix House Director,
"Combating Drug Addiction"
CPT Curt Smothers,
U. S. Army JAG Corps,
"Equal Opportunity Policy within the Army"

Office of Military Instruction

MG James C. Smith,
C.G. 1st Cavalry Division (TRICAP),
"The TRICAP Division"
LTC R. W. Dawnay,
British Liaison Officer, USAIS, Fort Benning, Ga.,
"Urban Insurgency—Northern Ireland"
LTC E. P. Sydnor, Jr.,
Chairman, Co Tactics Cmte, USAIS, Fort Benning, Ga.,
"The Airmobile Raid at Son Tay"
Professor L. B. Kirkpatrick,
Professor of Political Science and University Professor, Brown University,
"Stability Operations World-wide"
USMC Amphibious Warfare Presentation Team,
"Amphibious Warfare Study XX-Operation Phantom Eagle"
LTC R. D. Hooker,
Directorate of Military Support, Department of Army,
"The US Army's Role in Civil Disturbances"
CPT D. S. Berkman,
Nuclear Weapons Employment Division, USAAS, Fort Sill, Okla.,
"Nuclear Weapons Operations"
BG E. P. Forrester,
Chief, OPD,
"Career Planning Factors for USMA Graduates"



Instruction Support Division



Academic Computer Center
Instructional Technology Center
Academic Management Information Center

Director, Permanent Associate Professor
COL WILLIAM F. LUEBBERT,
B.S., United States Military Academy;
M.S., E.E.A., Ph.D., Stanford University,
Army War College

Deputy Director, Assistant Professor
LTC HAROLD C. HANNAWAY,
B.A., Boston College;
M.B.A., New York University

Chief, Instructor Group ACC and ITC, Instructor
MAJ JOHN P. KANE,
B.S., Boston College;
B.S., United States Military Academy;
M.S., Georgia Institute of Technology

Instructor
CPT CHARLES HERNANDEZ,
B.S., United States Military Academy;
M.S., Stanford University

Instructor
2LT RICHARD L. MIDDLETON,
B.S., M.S., Kansas State University

Chief, Academic Management Information Center, Assistant Professor
MAJ ROBERT A. KAISER,
B.S., E.E., University of Detroit;
M.S., Stanford University

Associate Director, Academic Computer Center Activities, Assistant Professor
MAJ HENMAR R. GABRIEL,
B.S., United States Military Academy;
M.S.E., Arizona State University

Assistant Director, Computer Systems, Assistant Professor
CPT LANSE M. LEACH,
B.S., United States Military Academy;
M.S., Stanford University

Associate Director, Instructional Technology Center Activities, Assistant Professor
MAJ JAMES D. BAKER,
B.A., University of Alabama;
M.S., University of Southern California

Assistant Director, Media & Instructional Systems, ITC, Assistant Professor
MAJ DENNIS D. WILLIAMS,
B.S., University of South Dakota;
M.S., University of Southern California

Audio-Visual Production Officer, ITC, Instructor
MR. FURMAN S. BALDWIN,
B.A., M.A., University of Buffalo

Enlisted Instructors:

The following enlisted instructors hold B.S., B.A. or higher degrees but do not have faculty status: Robert Blase, David Ciminski, Leo Dioguardi, Edward Dofter, William Doty, Robert Ewald, Charles Fisher, James Gaver, Paul Hagenbach, Donald Holtz, Peter Jewell, David Kayden, John Meszaros, Michael Muth, Michael Popovich, David Sender, Gary Sheetz, Charles Stinemetz, Walter Thieman, Stanley Vestal, Paul Wheeler, Richard Wills, Steven Wilson.

The Academic Computer Center provides collegiate curriculum support services to all academic departments and activities of USMA for academic-related functions. The Academic Computer Center provides technical advice and support for instruction in cadet classes and USMA Staff and Faculty courses; operates the computing facility; performs technical consultation for cadets and instructors, and does data processing of cadet related records.

Located on the first floor of Thayer Hall, the Academic Computer Center consists of a large, third-generation computer (Honeywell-635 computer system), a comprehensive time-sharing communications system extending to all academic areas of the Academy, two smaller processors (Honeywell-225 computer systems), and Computer-Assisted-Instruction (C-A-I) Laboratories equipped with latest interactive computer terminals and graphic peripheral devices designed specifically to support cadet instruction. The Academic Computer Center's Time-Sharing System supports over 120 remote computer terminals (teletypewriters) and computer-graphics terminals located throughout the Academy in most academic departments and in ten "home-based" computer terminal service centers in all academic buildings and most cadet barracks.

Instructional Technology Center facilities include a modern, well-equipped color studio and control room with studio cameras, professional video tape recorders, slide and motion picture equipment, and special effects generators. Working closely with Instructors, the Institutional Technology Center produces 16mm educational films, single-concept, super 8mm films, and multi-image and multi-media instructional programs. A closed-circuit color distribution system carries the instructional programs to over 440 classrooms and to the Library. Large screen television is available in auditoriums and lecture halls, and candid videotapes of classroom and physical skills situations are recorded on portable equipment.

The Instructor Group prepares and conducts interdepartmental faculty and cadet instruction programs, and provides consultation services and technical assistance in the development, application, and use of computer systems, television, and other educational media in support of cadet instruction or educational research. It administers the Dean's Reading Improvement Program, a developmental reading course for cadets, faculty and staff members. The Instructor Group also writes and publishes reference manuals for users of the Academic Computer Center.

The Academic Management Information Center provides data processing, programming, and systems analysis services in direct support of academic curriculum administration using disk-oriented data concepts on the H-635 computer.

SCIENCE RESEARCH LABORATORY

Director, Assistant Dean for Academic Research, Permanent Associate Professor

LTC WILLIAM B. STREETT, JR.,
B.S., United States Military Academy;
M.S., Ph.D., University of Michigan

Research Officer

CPT DONALD J. GORDON,
B.S., Howard University;
Ph.D., Oregon State University

Research Officer

LT MARC CONSTANTINO,
B.S., Rensselaer Polytechnic Institute;
Ph.D., Princeton University

Research Officer

LT D. FOSS SMITH, JR.,
B.S., Georgia Institute of Technology;
Ph.D., University of Minnesota

This facility, supervised by the Dean, affords the Academy faculty an opportunity to conduct original research in the physical and engineering sciences. Current research, much of which is supported by grants, includes meaningful projects in areas such as infrared spectroscopy and planetary physics.

USMA Library

Librarian, USMA
Mr. Egon A. Weiss,
B.A., Harvard University;
M.A., Boston University;
M.S. (Library Science), Simmons College

Associate Librarian
Mr. J. Thomas Russell,
B.A., Kenyon College;
M.A.L.S., University of Michigan

Assistant Librarian, Collection Development and Technical Services
Mr. James E. Pearson,
B.A., M.A., University of Oklahoma;
M.A. (Library Science), University of Minnesota

Assistant Librarian, Reference and Resource Utilization
Miss Ann K. Harlow,
A.B., Duke University;
B.S. in L.S., University of North Carolina

Assistant Librarian, Public Services
Mrs. Marilynn K. Smith,
B.A., Butler University;
M.A., University of Colorado;
M.S.L.S., Columbia University

Assistant Librarian, Special Collections
Dr. Edward P. Rich,
B.A., Haverford College;
D.D.S., University of Pennsylvania;
M.S.L.S., Drexel Institute;
Lilly Fellow, Indiana University

Chief, USMA Archives and History
Mr. Stanley P. Tozeski,
A.B., Clark University;
M.A., University of Massachusetts

Librarian, Rare Books Cataloging
Mr. Alan C. Aimone,
B.S., Eastern Illinois University;
M.A.L.S., Rosary College

Librarian, Periodicals
Mr. Nicholas S. Battipaglia, Jr.,
B.A., State University of New York at Albany;
M.L.S., Florida State University

Librarian, Maps and Manuscripts
Mrs. Marie T. Capps,
B.A., Central Washington State College;
M.L.S., State University of New York at Albany

Librarian, Circulation
Miss Elizabeth J. Connolly,
B.A., St. Joseph's College for Women

Librarian, Serials
Mrs. Johanna R. deOnis,
B.A., State University of New York at New Paltz;
M.L.S., State University of New York at Albany

Librarian, Cataloging
Miss Elizabeth K. Dunn,
A.B., University of Kansas;
M.A. in Librarianship, University of Denver

Librarian, Special Projects
Miss Martha M. Earl,
B.A., B.L.S., University of California at Berkeley

Librarian, Government Documents
Miss Irene Feith,
B.A., Ladycliff College

Librarian, Audio/Visual
Mr. Allen D. Hough,
B.A., Kearney State College;
M.S.L.S., Syracuse University

Librarian, Cataloging and Orientalia
Mr. Pingkun Lee,
L.L.B., University of Peiping;
M.S.L.S., Catholic University of America

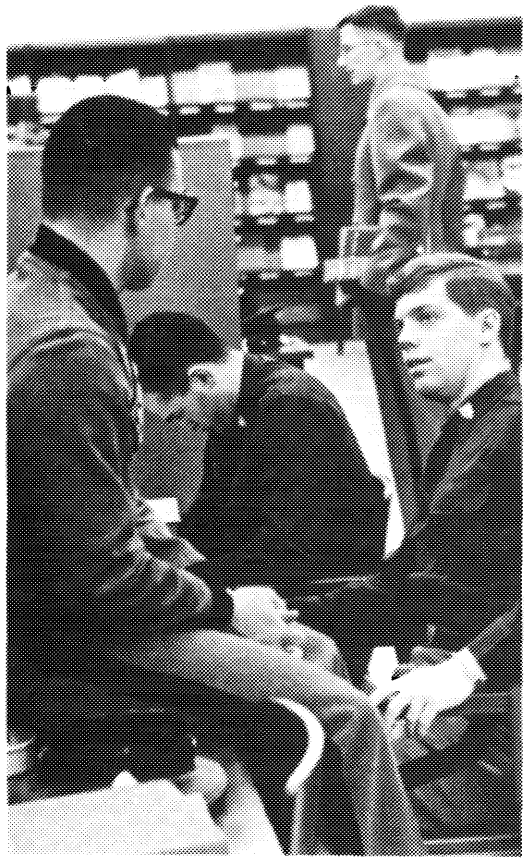
Librarian, Fine Arts
Mrs. Elizabeth M. Lewis,
B.A., Purdue University;
M.L.S., Pratt Institute

Librarian, Head Cataloger
Miss Anna E. Pierce,
B.S., State University of New York at Geneseo

Assistant Archivist
Mr. Kenneth W. Rapp

Librarian, Acquisitions
Mr. Michel H. Ridgeway,
B.A., Bowdoin College;
M.L.S., Columbia University

Librarian, Cataloging
Miss Sharon F. Wilbur,
B.A., M.L.S., Texas Woman's University



The library book collection contains 320,000 volumes. The building, however, has a storage capacity for 500,000 volumes and provides seating for over 1,000 readers. Current subscriptions include 1,600 periodicals and 64 newspapers, domestic and foreign. Microfilm and microcard readers and printers are available in sufficient number to make possible effective use of the library's expanding microform holdings. The audio-visual resources include approximately 8,000 disc records and tapes of linguistic materials, drama, poetry, classical and popular music. Audio booths are equipped for stereophonic listening and recording. In addition, visual materials are available in the form of prints, slides, drawings and mounted pictures.

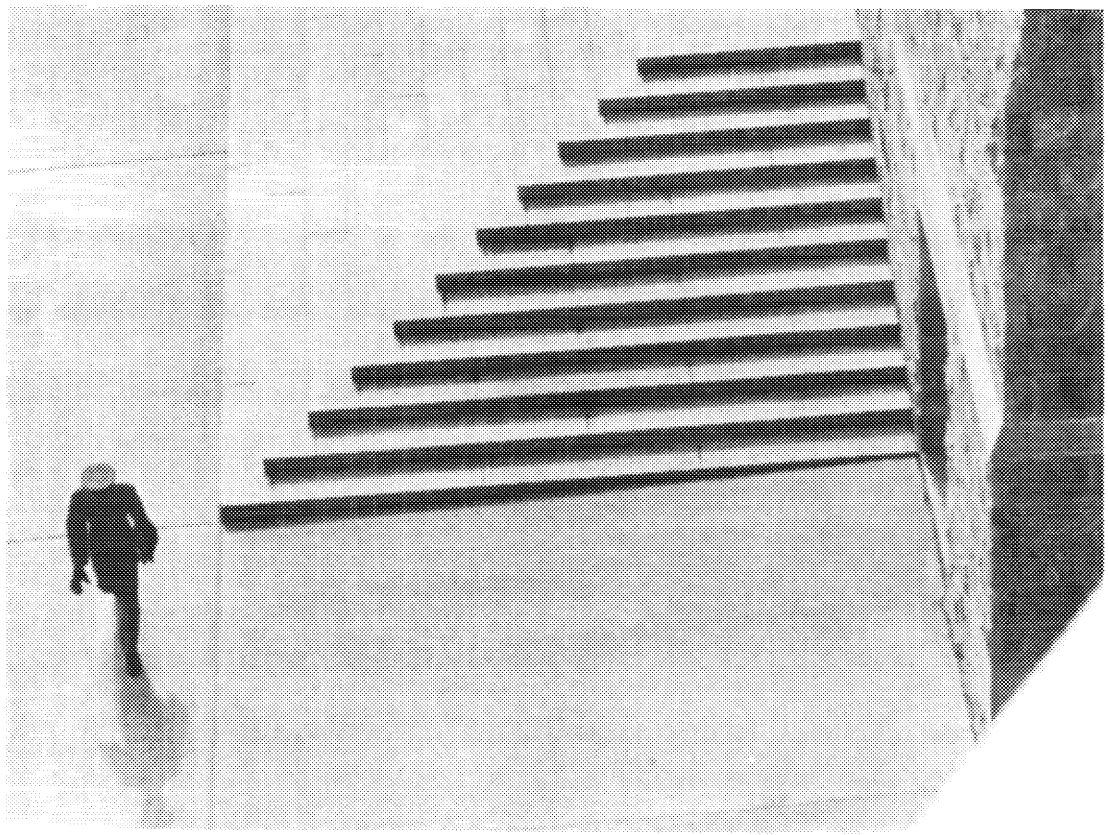
The library is designated a partial depository for the publications of the United States Government. United Nations, NATO, SEATO and regional publications are housed in the documents room of the library.

The library book collection represents the first federal library and antedates the founding of the Academy in 1802 by almost a quarter of a century. The first substantial acquisitions were made between 1815 and 1817 when Major Sylvanus Thayer, Superintendent USMA, 1817-1833, on official duty in Europe was authorized by the Secretary of War, James Monroe, to purchase landmark texts in the arts and sciences. Major Thayer obtained about 1,000 volumes which formed the basis for early engineering education in the United States.

The present library resources are similar to those of a liberal arts college and reflect considerable strength in the mathematical, scientific, and technical fields. The library's extensive holdings in the areas of military art, history and technology have established its reputation as a research library of national importance.

The Special Collections Division includes substantial manuscript and rare book holdings which are concerned primarily, though by no means exclusively, with the history of the U.S. Army, the Military Academy, and persons of the military profession. The USMA Archives maintains cadet records and the Military Academy's administrative records.

Cadets have free access to the library stack areas. Oral and written instructions guide them in the use of catalogs, bibliographies and other reference resources. The facilities of the library are available to *bona fide* researchers. During the Academic Year the library is open from 8:00 A.M. to 11:00 P.M., Monday to Thursday, 8:00 A.M. to 10:00 P.M., Friday, 8:00 A.M. to 9:00 P.M., Saturday, and 1:30 to 11:00 P.M., Sunday. The Special Collections Division and the USMA Archives are open from 8:00 A.M. to 4:30 P.M. Monday through Friday.



Graduate Civil Schooling

The expanding world commitments of the Army, and technological advances, have created an increasing requirement for officers to attend civilian graduate institutions. It is anticipated that approximately 80 per cent of Academy graduates remaining on active duty will attend graduate school under the auspices of either the Early Graduate Schooling program, the Civil Schooling program, or on a scholarship or fellowship.

Early Graduate Schooling Program

Distinguished Graduates of the Military Academy, the top five percent of each class, may be selected for immediate return to graduate school. These officers may defer their graduate studies until a later time, if they prefer.

Civil Schooling Program

Qualified graduates may anticipate selection for attendance at graduate school in a master's or doctoral program between their fourth and tenth year of military service.

Medical Schooling

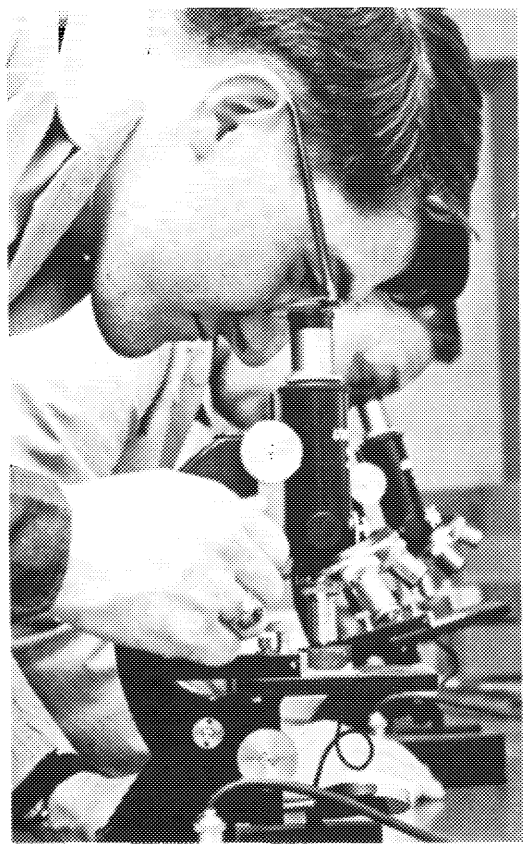
Graduates who are highly motivated toward careers as Army physicians, the number not to exceed one per cent of the class, may enter medical school immediately after graduation.

Rhodes Scholarships

From the first USMA participation in the Rhodes Scholarship program in 1923, fifty Military Academy graduates have been awarded Rhodes Scholarships to attend Oxford while on active duty as commissioned officers.

Elections for Rhodes Scholarships are held every year in December for entrance into Oxford in October of the following year. The scholarships are for a minimum period of two years; a third year may be awarded if the Rhodes scholar presents a plan of study acceptable to his service and to the Rhodes trustees.

Cadets desiring to compete for a scholarship from their home, or New York State, must be accredited by the Academic Board. A Committee of Selection in each state recommends two candidates yearly to a six-state District Committee, which then selects the most outstanding four scholars.



Selection is based upon that section of Cecil Rhodes' will in which are mentioned the four groups of desired qualities: (1) literary and scholastic ability and attainments; (2) qualities of manhood, truth, courage, devotion to duty, sympathy for and protection of the weak, kindliness, unselfishness, and fellowship; (3) exhibition of moral force of character and of instincts to lead and to take an interest in his schoolmates; and, (4) physical vigor as shown by fondness for and success in manly sports.

Scholars are not chosen, however, from a system of averaging the above prerequisites. The first two groups of qualities are considered the most important, and committees are particularly interested in distinction of intellect and character giving promise of outstanding achievement in later life. Rhodes hoped that the scholar would "esteem the performance of public duties as his highest aim."

Olmstead Scholarships

The George Olmsted Foundation annually awards two scholarships to graduates of the Military Academy for two years of study at a foreign university in an other than English speaking country. Officers are considered for scholarships upon completion of a minimum of three years of service. The Foundation makes the selection from names submitted for consideration to the Department of the Army by the Academic Board. Selection criteria consist of both demonstrated scholastic ability and character and leadership traits at the United States Military Academy and in the military service after graduation. Universities attended by Military Academy graduates under this program have included those in Geneva, Grenoble, Heidelberg, Brussels, Tokyo, Freiburg, Paris, Lyons, Madrid, Bonn, and Saõ Paulo.

National Science Foundation Fellowships

Cadets annually compete for the one- or two-year National Science Foundation Graduate Fellowships, which provide for outstanding students to pursue graduate studies at the university of their choice. Selection is based upon academic records and examinations administered by the National Science Foundation. Since cadets began competing in 1961, a total of 23 have been awarded fellowships and 90 have received honorable mention.

Military Program

MISSION

To develop the qualities and attributes of leadership with emphasis on character as exemplified by integrity, morality, discipline and a strong sense of duty and responsibility.

To provide a broad basic military education.

To develop high standards of physical fitness.

To instill the motivation essential to the profession of arms and to provide orientation for a career in the United States Army.

Military instruction concentrates on the fundamental principles and concepts of tactics, study of leadership techniques, training in physical education, and indoctrination in career planning and motivation. It provides study, practice and orientation in the history, materiel, methods, and techniques of the Army and the other services of the Armed Forces of the United States. With this background the graduate has the foundation necessary for his progressive and continued development throughout his career as an officer of the Regular Army.

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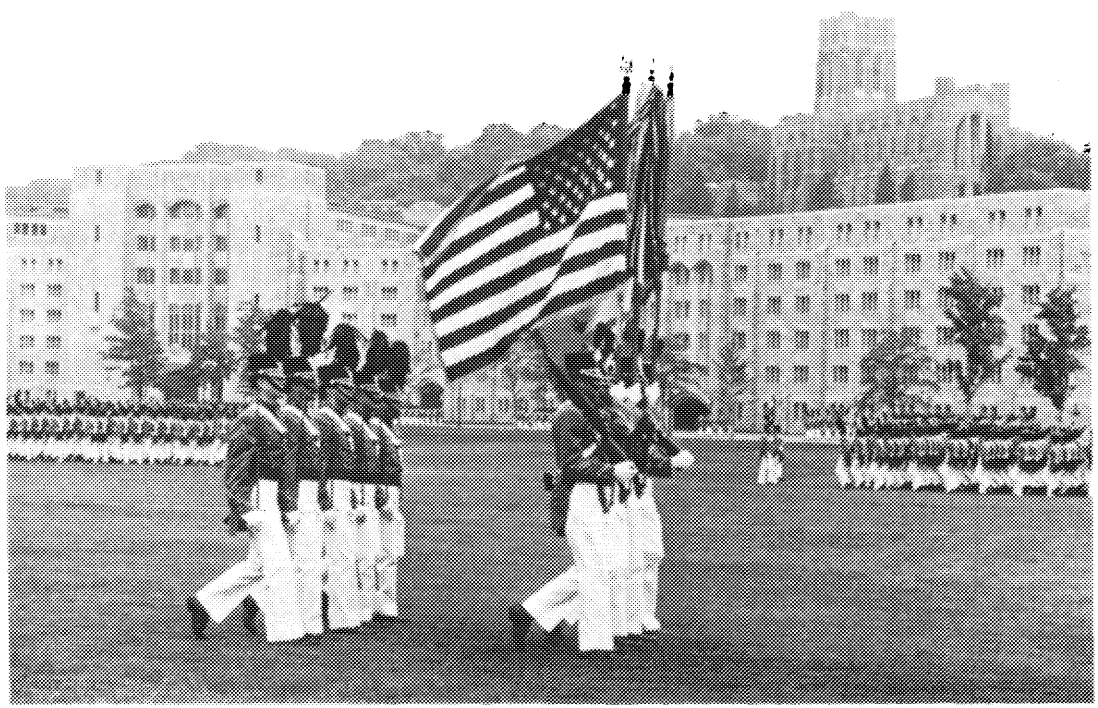


THE UNITED STATES CORPS OF CADETS ORGANIZATION

The student body at West Point is called the United States Corps of Cadets. The approximately 4,100 cadets of the Corps are organized into a brigade of four regiments. A cadet regiment consists of three battalions containing three companies, for a total of 36 companies in the brigade. Cadets of all four classes are assigned to each company, giving each company a strength of approximately 105 cadets.

The officer and senior noncommissioned officer positions within the cadet brigade are filled by cadets selected from the First (senior) Class. In command of the brigade is the Brigade Commander (Cadet First Captain) who has a staff consisting of Deputy Brigade Commander, a Brigade Adjutant, a Brigade Operations Officer, a Brigade Supply Officer, a Brigade Activities Officer, and a Brigade Athletic Officer. The four cadet regimental commanders and twelve cadet battalion commanders have staffs similar to that of the Brigade Commander. A cadet company commander is in charge of each company with subordinate cadet officers and noncommissioned officers in charge of smaller elements.

PAY AND ALLOWANCES

Cadets are members of the Regular Army and receive one-half of the basic pay of a Second Lieutenant with under two cumulative year's service. This amount exceeds $3,175 per year from which they must pay for their uniforms, textbooks, and incidentals. Room and board, and medical care are provided. The pay and allowances received are adequate to cover all expenses.

APPOINTMENT UPON GRADUATION

When a cadet has completed the course of instruction and meets required standards, he is, upon graduation, appointed a Second Lieutenant in the Regular Army of the United States.

LEADERSHIP EVALUATION SYSTEMS

The Leadership Evaluation System functions in accord with the basic responsibility of the Academy to produce officer leaders for the Armed Forces. The system assists in the maximum development of the leadership capabilities of each cadet and insures that graduates meet the standards required by the Army. The procedures of the system provide for evaluation of the leadership performance and potential of each cadet, counseling and guidance in

those areas in which any weakness is detected, and separation of any cadet who proves incapable of achieving the required standard of leadership.

The evaluation of cadet leadership is accomplished primarily through a program of ratings by officers and cadets. A relative standing for each cadet is established by mathematically combining the ratings of the Tactical Officer and cadets. The cadet standings are not published, but the cadet is informed of his general ranking within the class. The objective ratings are supplemented by descriptive comments regarding performance of specific duties and overall potential.

The Tactical Officer plays a key role in the counseling and guidance phase of the system. He conducts a series of interviews with each of his cadets in which he discusses any observed shortcomings, along with their probable cause, and counsels him in the means of improvement.

If, over an extended period of time, the cadet appears incapable of overcoming his deficiency and attaining the required leadership standards, his records are carefully studied by a board of senior officers of the Department of Tactics. The board interviews the cadet and such other cadets and officers as necessary for a thorough evaluation of the case. The Commandant reviews each board proceeding and refers those cases involving deficiency to the Superintendent for action by the Academic Board. These cases are then handled in the same manner as deficiency in an academic subject. All cases involving recommendation for separation by the Academic Board are referred to the Department of the Army for final approval.

THE HONOR CODE

The development of character and integrity in the members of the Corps of Cadets is a basic objective of the Academy. The Cadet Honor Code and System are officially recognized as primary means through which this objective is attained.

From the earliest days of recorded history it has been universally recognized that unquestioned integrity is an essential trait of the military leader. Colonel Sylvanus Thayer, the father of the Military Academy, determined that the Academy should produce leaders whose foundation was built on honor, integrated with a strong sense of discipline and excellence of knowledge. Since his day the role of honor has been maintained by the Corps and fostered by the authorities of the Academy. General Douglas MacArthur, shorty after World War I, was instrumental in formalizing the Honor Code and System and making them officially sanctioned means of building character. Today, the Honor Code is a most cherished possession of the Corps of Cadets and of the "Long Gray Line" of graduates.

The Honor Code has never outgrown its original and simple meaning — that a cadet will not lie, cheat, or steal, or tolerate those who do. The Code requires complete integrity in both word and deed of all members of the Corps and permits no

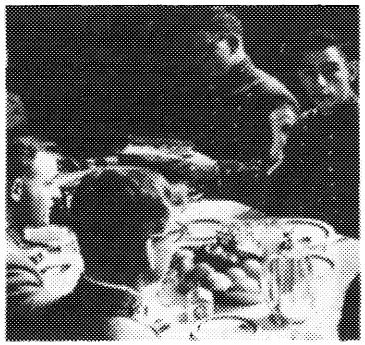
deviation from those standards. Not only is the cadet expected to tell the truth on all occasions but also to avoid quibbling or evasive statements. In the classroom a cadet does his own work. Under no circumstances will he take unfair advantage of his classmates. The maintenance of these high honor standards is the responsibility of each cadet, and each cadet is expected to report himself or any other cadet for violations of the Honor Code. These exacting standards are rigidly enforced, and any intentional violation by a cadet is cause for his separation from the Military Academy.

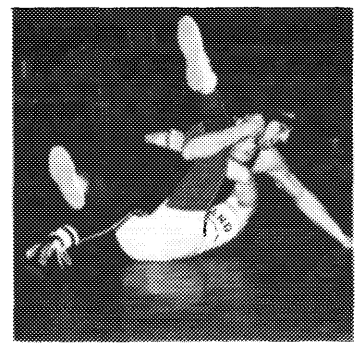
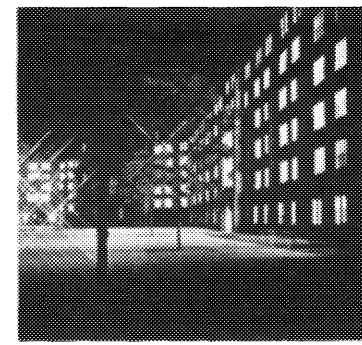
The Honor System is an integral part of the Honor Code and is the method by which the Honor Code is applied in the highly organized life of a cadet. As an example, cadets may account for their absence from their rooms simply by marking their absence cards. This marking is accepted as the cadet's word that his absence is authorized, and that he will remain within applicable limits. Cadets are also often required to indicate by signature that they have complied with official instructions. These devices are part of the Honor System that requires the cadet to make decisions based on his sense of honor many times a day during his 4 years at the Academy. In this respect the Honor System serves as a training vehicle to instill within each cadet the desire to abide by the precepts of the Honor Code.

For its success the Honor Code depends upon the Corps. The Cadet Honor Committee, elected by the Corps, monitors the operation of the Honor Code and System. It explains to the Corps the principles upon which the Code is based and guards against practices inconsistent with that Code. Thus, this Committee insures that the high standards of the Code are maintained and transmitted, undiluted, from class to class. Its procedures follow a set pattern, and its members have responsible authority. The Committee has no punitive powers, its functions being entirely investigative and advisory. If the Committee reports a cadet to the Commandant for an honor violation, the Commandant takes appropriate official action to insure that the standards of the Code are upheld while protecting the rights of the cadet in accordance with the provisions of the Uniform Code of Military Justice.

One of the Honor Committee's most important tasks is to supervise the indoctrination of the New Cadets in the principles of the Code. This indoctrination is both intensive and continuous and includes informal discussions as well as scheduled lectures. New Cadets are expected to adhere to the same standards as other cadets under the Honor Code. It is soon apparent to New Cadets that all members of the Corps share an inherent pride in upholding the exalted position of the Code. This observation, coupled with the indoctrination program, raises the varying standards of honor of an entering class to the uniformly high plane which the Corps has established and expects from its members.

The devotion of the Corps to the Honor Code is especially strong. In the opinion of both cadets and graduates, it is a particularly vital part of their education, training, and character-building at the Academy and makes a lasting impression on them.

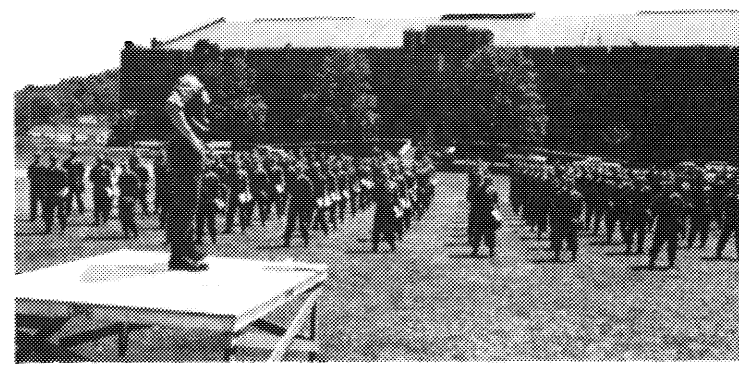


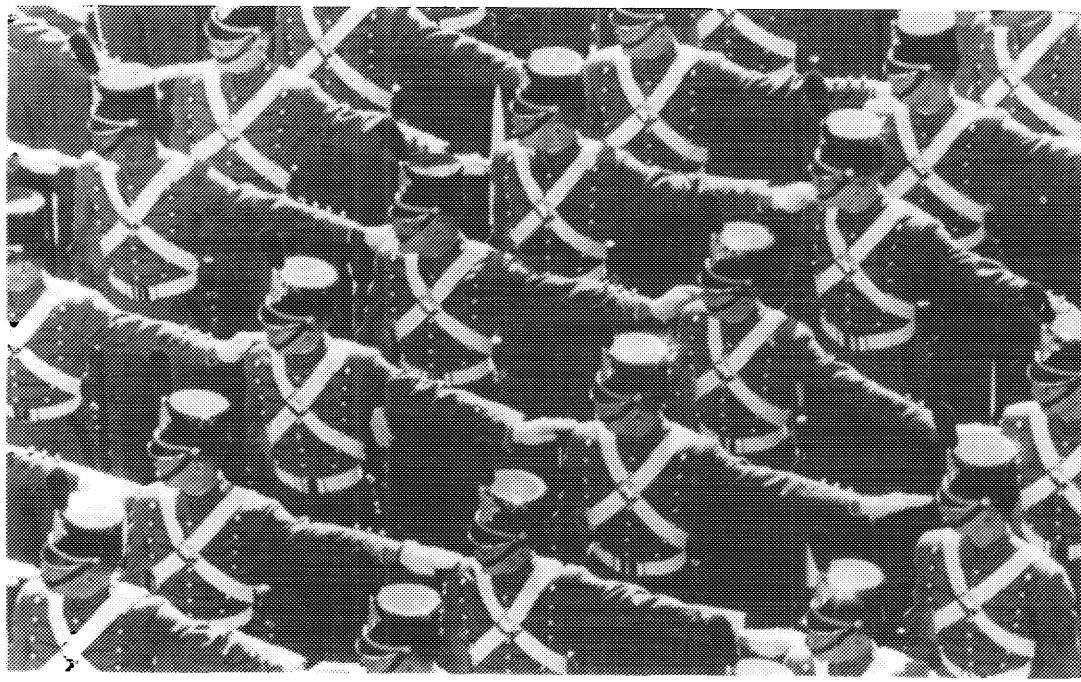



TYPICAL DAILY SCHEDULE

Morning:	
6:15	Reveille
6:15- 7:00	Breakfast
7:45-11:50	Class or study
12:10-12:50	Dinner
Afternoon:	
1:05- 2:05	Class or study
2:15- 3:15	Class or study
3:40- 6:00	Intramural/ intercollegiate athletics, or study time, parades, or extracurricular activities
6:15- 7:00	Supper
7:20-10:50	Study time
11:00	Taps. Late lights authorized for study purposes.

The schedule shown above is a typical daily schedule for a cadet during the academic year, September through May. Cadets also attend classes on Saturday morning. During the summer months, June through August, cadets take leave for approximately one month and devote the remaining time to military training.





DEPARTMENT OF TACTICS

Commandant of Cadets
BG PHILIP R. FEIR,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology;
M.S.I.A., George Washington University;
National War College

Aide-de-Camp
1LT RICHARD L. STRUBE, INFANTRY

Deputy Commandant
COL BURKE W. LEE, CORPS OF ENGINEERS,
B.S., United States Military Academy;
M.S.C.E., University of Illinois

S1, USCC
MAJ HENRY S. LARSEN, JR., FIELD ARTILLERY,
B.S., United States Military Academy;
M.S., Purdue University

Assistants, S1
MAJ ARTHUR S. DERVAES, III ARMOR,
B.M.E., Texas Christian University
MAJ DAVID L. COLE, FIELD ARTILLERY,
B.S., United States Military Academy;
M.S., Purdue University
CPT ROBERT W. HIGGINS, INFANTRY,
B.S., United States Military Academy;
M.S., Syracuse University

Operations Officer
LTC JAMES E. MAC GILL, INFANTRY,
B.S., United States Military Academy

Assistant Operations Officer
MAJ EDWARD G. RAPP, CORPS OF ENGINEERS,
B.S., M.S., University of Missouri at Rolla; Geol E, Colorado School of Mines
MAJ (RET) LUIS J. FLANAGAN,
B.S., United States Military Academy

S4, USCC
LTC ANDREW R. FOSTER, JR., FIELD ARTILLERY,
B.S., United States Military Academy

Assistants S4
MAJ JOSEPH F. MANZI, JR., CORPS OF ENGINEERS,
B.S., University of New Hampshire;
M.E., Texas A&M
MAJ ROBERT A. ZELLEY, FIELD ARTILLERY,
B.S., United States Military Academy

CAO
LTC LEONARD P. WISHART, INFANTRY,
B.S., United States Military Academy;
M.S., Nuclear Physics, University of Virginia

Assistant CAO
MAJ GEOFFREY D. WITHERS, INFANTRY,
B.S., United States Military Academy

USNA LNO
MAJ CHARLES L. WUERPEL, INFANTRY,
B.S., United States Military Academy;
M.S., University of Wisconsin

USAFA LNO
CPT PETER E. GLESZER, INFANTRY,
B.S., United States Military Academy;
M.S., Purdue University

Royal Military Academy LNO
CPT ROGER YANKOUPE, CORPS OF ENGINEERS,
B.S., United States Military Academy;
M.A., University of Illinois

1st Regiment
Commanding Officer
COL FLOYD G. STEPHENSON, INFANTRY,
B.S., United States Military Academy;
Army War College

Executive Officer
LTC (P) MICHAEL P. JUVENAL, INFANTRY,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology

S1
MAJ GERALD E. WEBB, INFANTRY,
B.A., Rutgers University

Tactical Officers
MAJ EUGENE S. ANDREWS, INFANTRY,
B.S., Boston University;
M.A., Syracuse University
MAJ JOHN H. DORLAND, INFANTRY,
B.S., United States Military Academy;
M.S., University of Southern Mississippi
MAJ GEORGE A. JOULWAN, INFANTRY,
B.S., United States Military Academy;
M.A., Loyola University
CPT JAMES B. BRIGGS, FIELD ARTILLERY,
B.S., Texas A&M;
M.S., Texas A&M
CPT THOMAS E. BURCH, USAF,
B.S., United States Naval Academy
CPT GEORGE S. GEHRINGER, AIR DEFENSE ARTILLERY,
B.S., United States Military Academy;
M.S., Texas at El Paso
CPT COLIN O. HALVORSON, ARMOR,
B.S., United States Military Academy;
M.S., University of Colorado
CPT CLOVIS O. LAFOND, CORPS OF ENGINEERS,
B.S., United States Military Academy;
M.A., George Washington University
CPT GERALD C. WERNER, ARMOR,
B.S., United States Military Academy;
M.S., Purdue University

2d Regiment
Commanding Officer
COL WALTER C. COUSLAND, ARMOR,
B.S., United States Military Academy;
M.A., University of Pennsylvania

Executive Officer
LTC JOHN F. BLANCK, FIELD ARTILLERY,
B.S., United States Military Academy

S1
MAJ EDWARD M. GRIPKEY, INFANTRY,
B.S., Kansas State College, Pittsburg, Kansas

Tactical Officers
MAJ JOHN V. GALLUCCI, INFANTRY,
B.A., Gonzaga University;
M.S., Gonzaga University
MAJ GLYNN C. MALLORY, JR., INFANTRY,
B.S., United States Military Academy;
M.A., University of Georgia
MAJ PHILIP E. PONS, JR., INFANTRY,
B.S., United States Military Academy;
M.A., Purdue University

MAJ COURTNEY M. RITTGERS, INFANTRY,
B.S., United States Military Academy
CPT FRANK M. APPLIN, FIELD ARTILLERY,
B.S., United States Military Academy;
M.A., Syracuse University
CPT EMMETTE Y. BURTON, III, INFANTRY,
B.S., University of Virginia
CPT JOHN R. HAYES, ARMOR,
B.S., United States Military Academy;
M.A., University of North Carolina
CPT STEPHEN J. KEMPF, AIR DEFENSE ARTILLERY,
B.S., United States Military Academy;
M.S., University of Minnesota
CPT THOMAS B. SURLES, ARMOR,
B.A., Auburn University;
M.A., Syracuse University

3d Regiment
Commanding Officer
COL RAYMOND MALADOWITZ, INFANTRY,
B.S., United States Military Academy;
M.A., Middlebury College

Executive Officer
LTC (P) HUGH G. ROBINSON, CORPS OF ENGINEERS,
B.S., United States Military Academy

S1
MAJ DANIEL R. SCHROEDER, CORPS OF ENGINEERS,
B.S., United States Naval Academy;
M.S., USAF Institute of Technology

Tactical Officers
MAJ WILLIAM H. GAVAN, INFANTRY,
B.S., United States Military Academy;
M.A., North Carolina State University
MAJ KENNETH N. HOLLANDER, AIR DEFENSE ARTILLERY,
B.S., United States Military Academy
MAJ JOHN F. NITKOWITZ, FIELD ARTILLERY,
B.S., United States Military Academy;
M.S., University of Utah
MAJ HANS O. WAGNER, ARMOR,
B.S., United States Military Academy
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B.S., United States Military Academy;
M.A., Purdue University
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B.A., LaSalle College;
M.A., Purdue University
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M.S., University of Utah
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M.A., University of Georgia
CPT JAMES H. WOOD, INFANTRY,
B.S., United States Military Academy;
M.A., Syracuse University

4th Regiment
Commanding Officer
COL THOMAS E. FITZPATRICK, INFANTRY,
B.S., United States Military Academy

Executive Officer
MAJ (P) ROBERT A. TURNER, INFANTRY,
B.S., United States Military Academy

S1
MAJ FRANK W. PARKER, FIELD ARTILLERY,
B.S., The Citadel

Tactical Officers
MAJ CHARLES SCHMIDT, ARMOR,
B.S., United States Military Academy
MAJ DALE W. SHIPLEY, INFANTRY,
B.S., United States Military Academy;
M.A., Purdue University
CPT JAMES E. BRYAN, INFANTRY,
B.S., United States Military Academy
CPT JOHN M. HOWELL, FIELD ARTILLERY,
B.S., United States Military Academy
CPT SETH HUDGINS, ARMOR,
B.S., United States Military Academy
CPT HERBERT J. SMITH, III, AIR DEFENSE ARTILLERY,
B.S., United States Military Academy
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M.A., George Washington University
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M.S., Purdue University
LCDR MICHAEL J. MACDONALD, USN,
A.B., Bates University

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OFFICE OF MILITARY INSTRUCTION

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B.S., United States Military Academy
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B.S., Arkansas University

Fourth Class Military Instruction

Summer

Fourth Class Summer Training

The summer period consists of basic military training in preparation for military life and orientation and indoctrination in duty, honor, and the traditions of West Point. The period in New Cadet Barracks is one of intensive fundamental military training to include qualification with the U.S. Army rifle and basic individual training designed to prepare the new cadet to take his place in the Corps when it reassembles late in August.

8 Weeks. Ungraded.

Academic Year

Military Science 1

MS 101 Introduction to Military Science

The instruction is designed to develop in the cadet an appreciation of the history and traditions of the profession of arms and to instill a pride in that profession; to provide the cadet with a working knowledge of basic map reading in preparation for subsequent military training.

1.5 Credit Hours.

MS 102 Fundamentals of Military Operations

Continued instruction in map and aerial photograph reading to enable the cadet to recognize and evaluate landforms and their effect on military operations. Instruction is designed to develop a basic understanding of the principles and procedures employed in planning and executing military operations and in applying this knowledge to rifle platoon operations. *1 Credit Hour.*

Third Class Military Instruction

Summer

Third Class Summer Training

To enhance soldier skills in marches, fieldcraft, communications, land navigation, adjustment of indirect fire, first aid, mountaineering, hand to hand combat and survival; to provide familiarity with the mission, organization and employment of the infantry, tank and armored cavalry platoons to include firing of weapons organic to the maneuver battalion and in experience in small unit tactics at squad and platoon level in both daylight and night operations; to provide orientation on the combat support role of the Field Artillery Battery, Air Defense Artillery, the Combat En-

gineer Company, and the Communications Platoon; to provide an orientation on the planning and conduct of airmobile operations; to develop self-confidence through performance under conditions of mental and physical stress; to provide high standards of physical conditioning, appearance, discipline and esprit; and to provide leadership experience through troop leading in a simulated combat environment.

8 Weeks. Ungraded.

Academic Year
Career Training
MI 201 Service Orientation

A series of conferences and seminars designed to broaden the military background of the Third Classman, to acquaint him with the Army way of life, and to familiarize him with the management policies for career patterns, development and utilization of commissioned officers in the U.S. Army. *Ungraded.*

Military Science II
MS 202 Command Functions

A series of conferences and practical exercises to teach the cadet the basic considerations and resources available to the commander in the application of military power. The course stresses command and staff relationships, the functional staff areas of personnel, intelligence, operations, logistics and civil affairs and the content and application of the estimate of the situation and the operation order. *1.5 Credit Hours.*

Second Class Military Instruction

Summer
Second Class Summer Training

The cadet has an opportunity to participate in one of the following regular Army training programs: Airborne or Ranger at Fort Benning, Georgia; Jungle Warfare in Panama, Northern Warfare in Alaska, or Aviation at Fort Wolters, Texas. Most will also serve one month of Army Orientation Training as a platoon leader in a regular U.S. Army unit.

1 Month. Ungraded.

Academic Year
Career Training
MI 304 Career Information

An introduction to career planning to include the challenge of the profession of arms, junior officer experiences, and branch selection considerations. *Ungraded.*

Military Science III
MS 301 Combined Arms Operation

Instruction addresses the organization and basic principles employed by combined arms forces at battalion level. *1 Credit Hour.*

MS 302 Special Operations

Instruction applies the principles of offensive and defensive tactics, to special operations, airborne, airmobile, river crossings, combat in built-up areas and the special consideration of nuclear warfare. Additionally, lessons are conducted on Amphibious Operations, Civil Disturbances and Missions and Roles of the USN, USMC and USAF.

1 Credit Hour.

First Class Military Instruction

Summer

First Class Summer Training

(1) An orientation on the roles, tactics, techniques, equipment, and new developments in Infantry, Armor, Artillery, Engineer, Signal and Air Defense Artillery through an orientation trip to selected military posts. *2.5 Weeks. Ungraded.*

(2) One month duty either as a platoon leader with a combat unit of the U.S. Army for cadets who did not receive this type training in Second Class Year, or at command and staff levels during New Cadet Barracks or Camp Buckner.

4 Weeks. Ungraded.

Academic Year

Career Training

MI 400 Career Planning

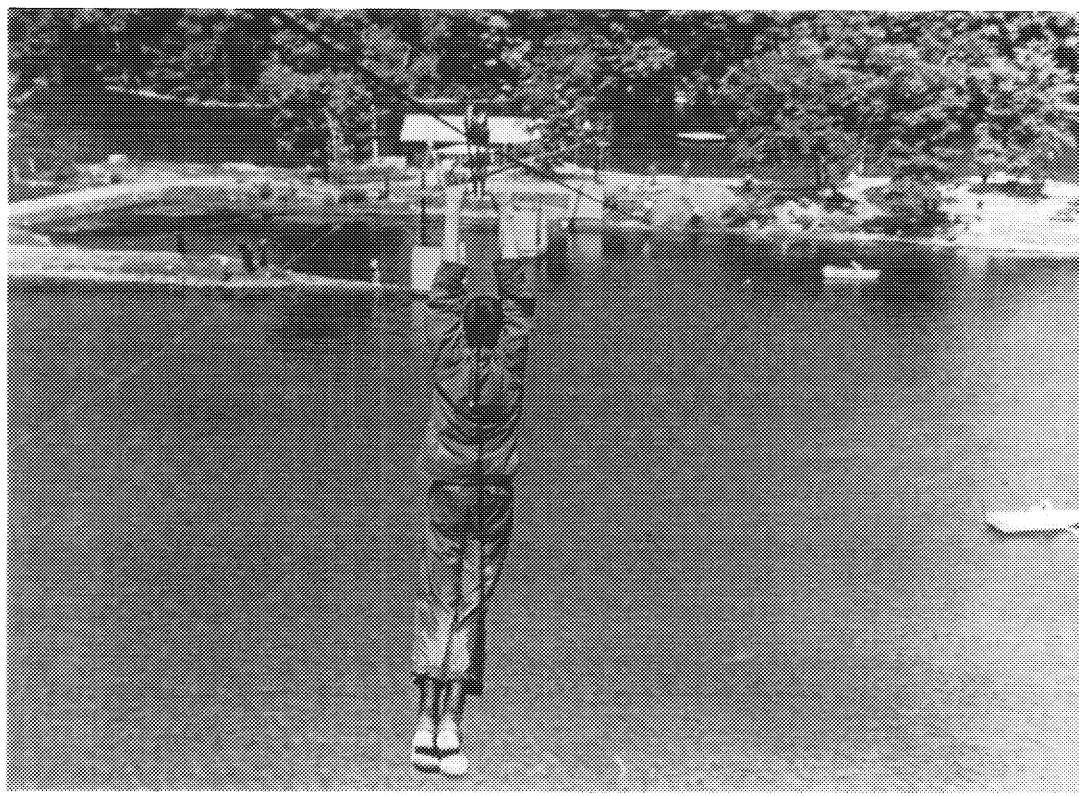
Guidance on career planning designed to assist in making the transition from cadet to junior officer, to prepare the cadet for his immediate decisions in selecting a branch of service and first duty station, and orientations in preparation for his initial schooling and troop assignments.

Ungraded.

Military Science IV

MS 401 Stability Operations

Instruction in that portion of internal defense and internal development assistance operations provided by the U.S. Army, with emphasis on the tactics and techniques of the brigade, battalion and company operating in a counter-guerrilla environment. *1 Credit Hour.*



OFFICE OF MILITARY PSYCHOLOGY AND LEADERSHIP

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M.S., University of Pittsburgh

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M.S., Purdue University

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M.B.A., Wharton School of Business

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M.S., University of Alabama

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M.A., University of Hawaii
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M.A., University of North Carolina
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M.S., University of Washington
CPT NORMAN L. GRUNSTAD, INFANTRY,
B.S., United States Military Academy;
M.S., Ohio State University
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B.A., Dubuque University;
M.S., University of Georgia
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B.S., United States Military Academy;
M.S., Duke University
CPT WAYNE R. WHEELER, INFANTRY,
B.S., United States Military Academy;
M.S., Ohio State University

STANDARD COURSES

PL 202 General Psychology

Both Terms — Prerequisites: None.

Provides the cadet with an understanding of scientific psychology required in the development of an understanding of the human aspects of command, military operations, and technology. Specific aims and areas of study are to engender a basic usable understanding of human development and individual differences, perception, learning, thinking, motivation, and emotion, adjustment, personality, social relations, the beginnings of leadership and applied psychology.

2.5 Credit Hours.

PL 252 Advanced General Psychology

Both Terms — Prerequisites: First 10 periods of PL 202.

The course amplifies the basic content of PL 202, General Psychology, by presenting to selected cadets additional course material and experimentation necessary to develop an appreciation of psychological research. This course utilizes a laboratory program to develop an understanding of scientific methodology used in the behavioral sciences and current research being conducted in the field of psychology. *2.5 Credit Hours.*

PL 201 Military Instructor Education

Third Class Summer and Spring Semester.

The course is designed to assist the cadet in developing basic teaching skills and platform presence through the actual presentation of lessons on instruction theory and military subjects.

PL 401 Military Leadership

Both Terms — Prerequisites: PL 202, 252 or validation.

The course contributes to the leadership development of cadets through an in-depth inter-disciplinary study of theories, models and behavioral science information related to leadership and the effective application of this information in a military environment. Topical problems are considered in the light of contemporary behavioral theory. *2.5 Credit Hours.*

ELECTIVE COURSES

PL 481 Managerial Psychology

Both Terms — Prerequisites: PL 202, PL 252 or validation.

This course provides the cadet with a conceptual grasp of the application of psychology to the management of personnel as well as programs in management. An understanding of common human behavior across organizations is developed. *2.5 Credit Hours.*

PL 482 Sociology

Both Terms — Prerequisites: PL 202, PL 252 or validation.

The course provides a basic understanding of one of the fundamental approaches to the study of social institutions, social problems, and processes including politics, leadership, and international affairs. Additional emphasis is also directed at the most current social problems facing the military and society. *2.5 Credit Hours.*

PL 483 Social Psychology

Both Terms — Prerequisites: PL 202, PL 252 or validation.

Provides the cadet with an understanding of how individual behavior is shaped and modified through interaction with others, to include, interpersonal perception, social motivation, and attitude formation and change — concepts which color the individual's outlook toward his physical and social environment. *2.5 Credit Hours.*

PL 484 Seminar on Military Institutions

Both Terms — Prerequisites: PL 202, PL 252 or validation.

This course introduces the field of military sociology. The focus is on American military organization in interaction with its individual members, component parts and other large-scale organizations. Key study topics are: military professionalism, civil-military relations, organizational forms, the military elite, the enlisted man, the draft, Modern Volunteer Army, radical relations, drug problems, dissent and anti-militarism.

PL 485 Behavioral Science Research

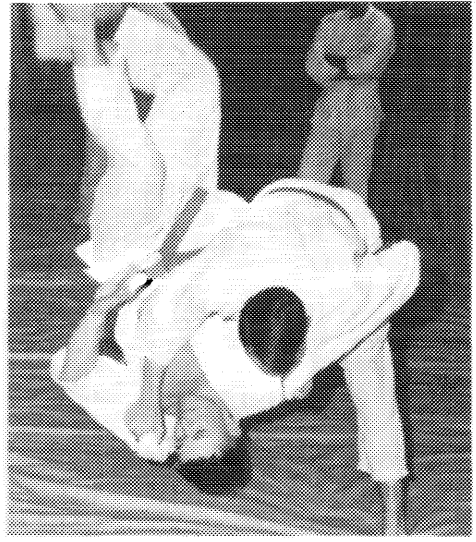
Both Terms — Prerequisites: PL 481 or PL 482 and approval of Director.

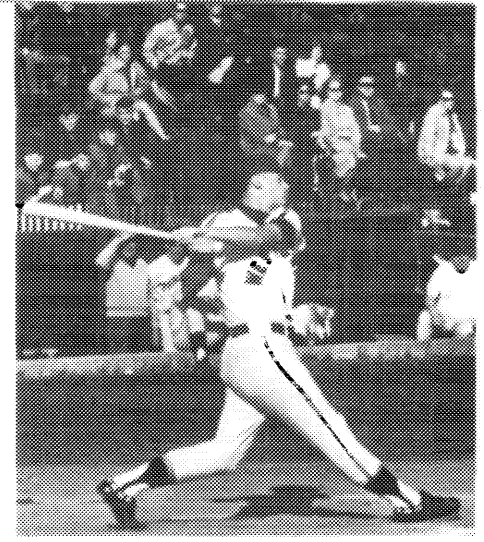
This course provides the cadet with an understanding of research design and methodologies applicable in studying topics of interest to the behavioral sciences. This objective is accomplished through the use of classroom instruction emphasizing the tools of the research scientist and an individual research project by each enrolled cadet. *2.5 Credit Hours.*

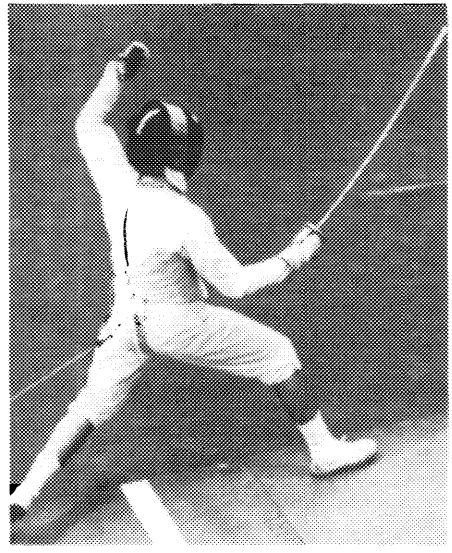
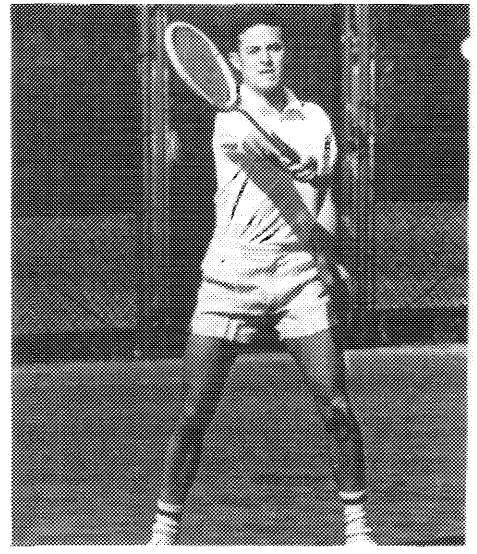
PL 486 Seminar in Organizational Behavior

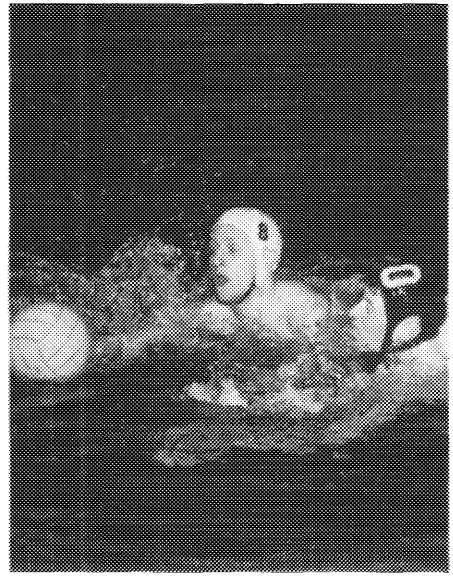
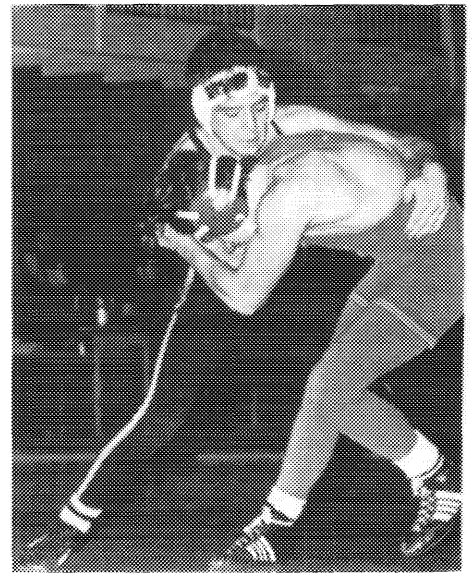
Both Terms — Prerequisites: PL 202, PL 252 or validation.

This course allows the cadet to develop an analytical framework for the study of all social organizations as dynamic, living units. The objective is to develop concepts which identify the common structural and functional elements present in all social organizations — from the Black Panthers and motorcycle gangs to the Department of Defense. Integration of principles drawn from psychology and sociology, and their application to social organizations at the macro level prepare the cadet for more detailed study of military institutions as a special type of social organization. *2.5 Credit Hours.*





Office of Physical Education

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B.S., United States Military Academy;
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M.A., New York University

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B.A., University of New Hampshire

Chief of Instruction
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M.S., Columbia University

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M.S., University of Virginia;
E.D.D., Temple University
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B.S., Springfield College;
M.A., Columbia University
MR WILLIAM F. LEWIS,
B.S., Springfield College;
M.A., New York University
MR HERBERT J. KROETEN,
B.A., University of Minesota;
M.Ed., Ohio State University

Assistant Professors:
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B.S., United States Military Academy;
M.S., University of Wisconsin
MAJ DENNIS A. LEACH, INFANTRY,
B.S., United States Military Academy;
M.S., University of Wisconsin
MAJ CORDELL S. GODBOLDTE, INFANTRY,
B.S., West Chester State College;
M.S., Indiana University
CPT MICHAEL J. NARDOTTI, INFANTRY,
B.S., United States Military Academy

Instructors
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B.S., University of Illinois;
M.S., Indiana University
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B.S., Marshall College
MAJ JOSEPH F. BLACKGROVE, INFANTRY,
B.S., United States Military Academy;
M.S., Indiana University
MAJ EUGENE B. BLACKWELL, INFANTRY,
B.S., United States Military Academy;
M.S., Indiana University
MAJ DAVID P. GLEICHENHAUS, FIELD ARTILLERY,
B.S., United States Military Academy;
M.S., University of Wisconsin
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B.S., University of Arkansas;
M.S., University of Arkansas
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B.S., United States Military Academy;
M.S., Indiana University
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M.S., Indiana University
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M.S., Indiana University
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B.S., United States Military Academy;
M.S., Indiana University
CPT STEVEN BERRY, INFANTRY,
B.S., United States Military Academy;
M.S., Indiana University
CPT GERALD E. DIXON, FIELD ARTILLERY,
B.S., United States Military Academy;
M.S., University of Wisconsin

CPT JOHN R. MALPASS, INFANTRY,
B.S., United States Military Academy;
M.S., Indiana University
CPT DAVID McKNIGHT, MILITARY INTELLIGENCE,
B.S., University of Texas at El Paso;
M.S., Indiana University
CPT DOUGLAS A. SIMS, AIR DEFENSE ARTILLERY,
B.S., United States Military Academy;
M.S., Indiana University
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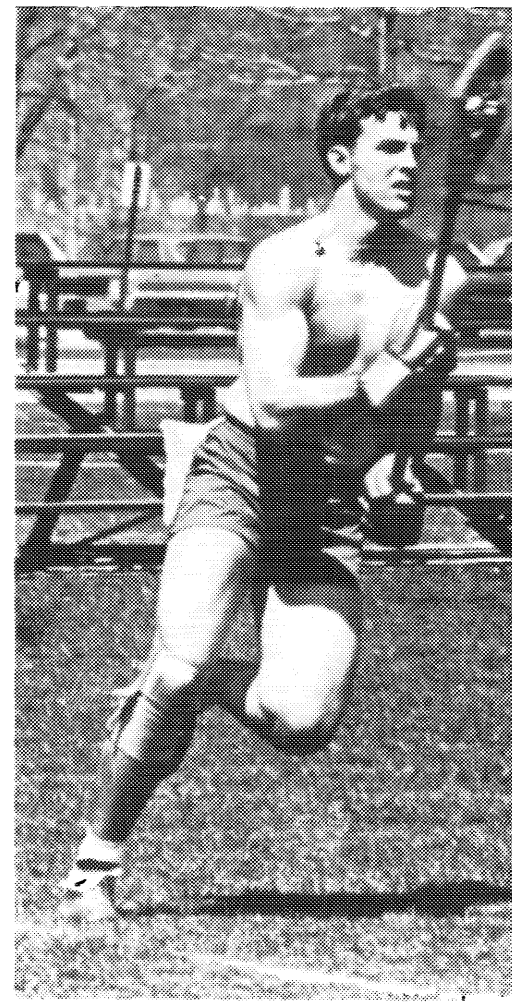
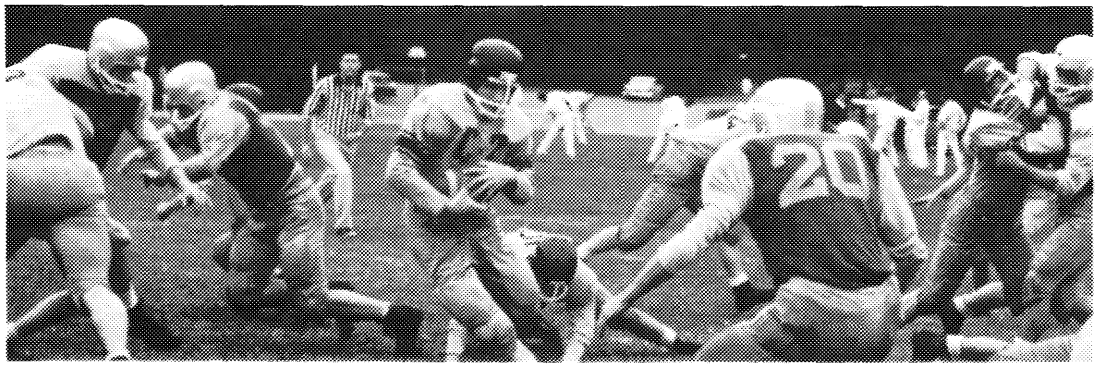
B.S., Idaho State University;
M.P.E., Idaho State University
LT DAN R. PAXTON, MILITARY INTELLIGENCE,
B.S., Utah State University;
M.S., Utah State University
LT JAMES A. PETERSON, FIELD ARTILLERY,
B.S., University of California at Berkeley;
M.S., University of Illinois;
Ph.D., University of Illinois
LT DANIEL J. SULLIVAN, ADJUTANT GENERAL CORPS,
B.S., University of Connecticut;
M.S., University of Massachusetts
MR LEROY A. ALITZ,
B.A., University of Iowa;
M.S., University of Massachusetts
MR DENNIS S. FORBES,
B.S., Wichita State University;
M.S., Wichita State University
MR JOHN D. LEMPERLE,
B.S., University of Utah;
M.S., Idaho State University
MR JOSEPH M. PALONE,
B.S., Cortland State College;
M.A., New York University
MR HENRY J. VEIX,
B.S., Cortland State College;
M.A., Columbia University
SP WALTER C. ISELIN,
B.S., Wisconsin State University
SP JOHN E. WESTBROOK,
B.S., Ithica College
PFC JAMES T. BILEC,
B.S., University of Pittsburgh
PFC GUY FLOM,
B.S., Northern Michigan University
PFC JOHN E. KNITTER,
B.A., Northeastern Illinois University
PFC CHARLES H. SHILLING, JR.,
B.S., Wake Forest University
PFC ROBERT F. STEINER,
M.A., Southeast Missouri State College

Trainer

MR JOHN W. POWELL,
B.S., Michigan State University;
M.S., Indiana University
PFC MICHAEL L. SARTORE,
B.S., Western Illinois University
SP CHARLES F. SOULE





The physical education program is designed to develop muscular strength, agility, endurance and coordination; to enhance mental health and overall efficiency; and to contribute to the development of certain personal attitudes essential to effective military leadership.

STANDARD COURSES

PE 100 Foundations in Physical Education

This course emphasizes the development of basic physical abilities in boxing, gymnastics, swimming, and wrestling. Instructions is provided in applied physiology, as well as in the carry-over sports of golf and tennis. Advanced students participate in handball and squash. Active participation in the athletic program of the Academy is required, with primary emphasis on maintaining good physical condition and developing additional sports skills. Standards of physical performance must be met in semester-end tests. *3 Credit Hours.*

PE 200 Sports Orientation

The objective of this course is to provide basic instruction in carry-over sports skills, to improve physical development, and to prepare for leadership in physical training. It provides instruction and experience in conducting physical training activities. Active participation in the athletic program of the Academy is required, with emphasis on maintaining good physical condition and developing additional sports skills. Standards of physical performance must be met in semester-end tests. *1.5 Credit Hours.*

PE 300 Sports Leadership

This course emphasizes leadership development in physical education by means of further instruction in sports skills, instructor preparation, coaching techniques, and athletic coaching experience. Active participation in the athletic program of the Academy is required, with emphasis on maintaining good physical condition and developing additional sports skills. Standards of physical performance must be met in semester-end tests.

1 Credit Hour.

PE 400 Advanced Sports Leadership and Athletic Skills

The objective of this course is to develop instructor and leadership ability through the administration of the third and fourth class summer physical training programs. Instruction in additional individual and team sports is provided. Emphasis is placed on carry-over athletic skills which promote physical fitness. Active participation in the athletic program of the Academy is required, with emphasis on maintaining good physical condition and developing additional sports skills. Standards of physical performance must be met in semester-end tests. *1.5 Credit Hours.*

ADDITIONAL COURSES

Individual Instruction

Special Programs of instruction are available in weight control, reconditioning, basic swimming, posture, corrective exercise, and physical conditioning to assist those who experience difficulty in achieving minimum standards of proficiency. Open to all classes.

Counseling and Advising

The Office of the Dean, the Academic Departments, the Department of Tactics, Chaplain, Surgeon, Treasurer, Registrar, and upper class cadets are available at all times to assist and offer guidance to cadets.

The Commandant is responsible for the overall counseling and administration of cadets. He exercises this function directly through Company Tactical Officers of the Department of Tactics, the Cadet Counseling Service of the Office of Military Psychology and Leadership, the Director of Physical Education, Cadet Officers, the Cadet Hostess, and through referral to the academic counselors in the Office of the Dean, faculty members, Chaplain, Surgeon, or Treasurer. Each Company Tactical Officer is responsible for the administration, training, welfare, and morale of his cadet company. Through daily, personal contact, the Tactical Officer is able to provide advice and guidance in overcoming personal problems that do not require professional care. The Cadet Chain of Command is also extremely effective in dealing with cadet problems on a peer counseling basis.

Professional counseling and advising is likewise provided by the Cadet Counselors and the Cadet Chaplains. Assistance in Physical Education matters is provided by the Office of Physical Education Staff Officers assigned to each company as a guidance counselor. Assistance concerning social problems is available through the Cadet Hostess.

Career counseling is also the responsibility of the Commandant, jointly through the Company Tactical Officer and the

Office of Military Instruction. The Career Branch of the Office of Military Instruction includes a senior branch instructor from each of the combat and combat support arms to facilitate career counseling prior to branch selection and commissioning for each graduating class. These senior branch instructors maintain liaison with the Office of Personnel Operations at Headquarters, Department of the Army, on assignment policies, procedures, and service school requirements to insure that accurate and current career information is always available.

The Dean of the Academic Board is responsible for counseling cadets on concentration of electives, overload courses, and elective course selection and changes; for course scheduling; and for coordination with the departments on problems of scheduling, eligibility and course changes.

The academic departments are responsible for counseling cadets on eligibility for validation and enrollment in advanced courses and are available for counseling on concentration of electives, overload courses, and elective course selections and changes.

The Director of Admissions, assisted by his Admissions Officers, is responsible for advising and counseling departing cadets relative to enrollment at other colleges.

The Treasurer, USMA, will, upon request, provide assistance with regard to financial matters.

The Surgeon, USMA, will, upon request, provide counseling or advisory assistance with regard to psychological or psychiatric problems.

Religious Activities

All cadets are provided a sound basic religious atmosphere. Each cadet must *attend a weekly* chapel service — Protestant, Catholic, or Jewish each Sunday.

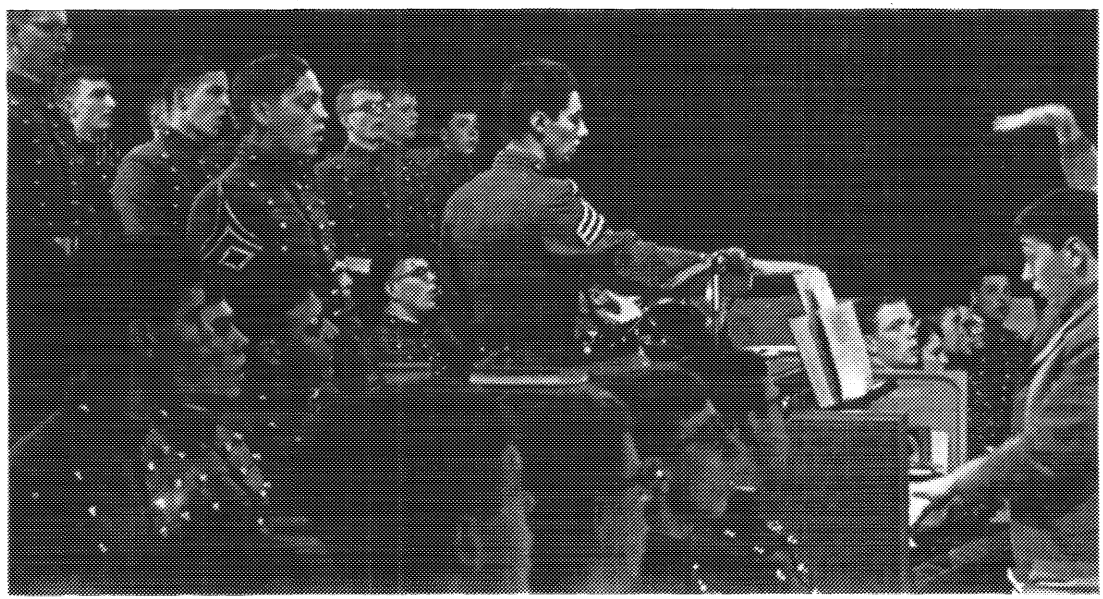
Protestant. Protestant services are held in the Cadet Chapel every Sunday during the academic year and out of doors during the summer months. The Reverend James D. Ford, B.D., is the Chaplain, USMA, the Reverend Michael B. Easterling and the Reverend Nelson W. Koscheski, Jr., are his assistants, and Dr. John A. Davis, Jr., is Organist and Choirmaster. At the Morning Worship Service the form of worship is interdenominational in character. Among the religious activities in which cadets take part are the Cadet Chapel Choir of 175 voices, the West Point Sunday School of 500 children of the Post taught entirely by 180 cadet teachers, the Cadet Chapel Acolytes, a program of Morning Devotions conducted every weekday at 6:15 A.M., evening discussion groups and annual religious retreats. *Attendance at separate denominational services on Sundays, in lieu of attendance at regular Cadet Chapel service, is permitted after Fourth Class year for denominations which furnish an accredited minister to conduct such services on post. There is no general provision for attendance by cadets at off-post services.*

Catholic. Catholic cadets attend Holy Trinity Chapel, which is the Catholic Chapel on the Post. The Reverend Robert F. McCormick is the Rector and the Rever-

end Maurice J. Regan is his assistant. Each Sunday Catholic members of the Cadet Regiments alternate in attending the early and late Masses to give opportunity for assisting at the late Mass. A Cadet Catholic choir sings at the Masses and other liturgical ceremonies. Cadet commentators, readers, and servers assist at all Cadet Masses. Daily Mass is celebrated at 6:20 A.M. throughout the academic year. Confessions are heard on Friday, daily at Mass time, and as desired. A Cadet Cardinal Newman Forum meets each week. By means of lectures, instructions, and seminars, it treats of religion, morals and philosophy. Cadets teach Sunday School every week to preschool and kindergarten children. Weekend retreats are also scheduled.

Jewish. Jewish worship services are held in the Old Cadet Chapel every Sunday at 8:30 A.M. during the academic year and at 8:15 A.M. during the summer season. Rabbi Avraham Soltes is the Jewish Chaplain. Festival services are conducted in the Old Cadet Chapel. The Jewish Chapel Choir sings the Liturgical music at every service. The Jewish cadets also participate in the reading of the Liturgy and in the Torah service. Religious instruction for Post children of the Jewish faith is conducted by cadets on Sunday morning.

Exceptions. In a bona fide case where attendance at religious services is in conflict with a cadet's sincerely-held convictions, he may request in writing that he be excused from attendance at Chapel. In cases approved by the Superintendent, cadets concerned will attend on Sunday, in lieu of Chapel, a period of discussion concerning the religious background and beliefs of the United States soldier and the impact his religious needs have on the responsibility of command.



Cadet Activities

A West Point cadet is one of the busiest college students in the nation. Yet, despite a tight schedule including studies, classes, parades, and other military functions, he manages to take advantage of the numerous extracurricular activities offered at the United States Military Academy.

As a future officer, the cadet must be a many-faceted individual. To cope with the complexity of modern warfare and the requirements inherent in leadership, cadets will need to acquire confidence and a working knowledge in a variety of fields. Extracurricular and recreational activities, in conjunction with the Military Academy's academic and military requirements, help give cadets the varied interest, knowledge, and experience in working with others needed for their future careers.

During the summer, facilities are provided for swimming and picnicking at Delafield Pond and Camp Buckner, and picnicking at Constitution Island. Picturesque Flirtation Walk winds for three-quarters of a mile along the majestic Hudson, offering a peaceful and shady retreat from the walls of the barracks. Cadets of the Third Class undergoing their military training at Camp Buckner during the summer months enjoy swimming, canoeing, fishing, skeet and trap shooting, water skiing and sailing. In the fall, the Corps takes one or more football trips to metropolitan areas. During the winter months, ice skating at Smith Rink and skiing at the Victor Constant Ski Slope are extremely popular.

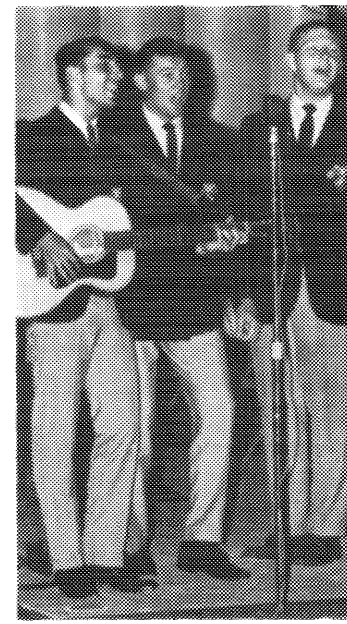
The snow-making capabilities, ski lifts, and ski trails are probably among the finest found on any campus in America. In addition, night skiing on the main slopes is available on the Military Reservation. Throughout the academic year, frequent hops (dances) are held in the Gymnasium and Cullum Hall, and movies are shown in the various theaters. Prominent entertainers are frequently brought to the Academy for performances. Construction has begun on the Cadet Activities Building which will be completed in 1974. The Activities Building will provide an auditorium with a 4,500 seating capacity, a large ball room, a Hostess Office, a games area, and a snack bar.

In addition to the general recreational, entertainment and social activities, there are numerous organized and active extra-curricular activities.

ACADEMIC GROUP
- Aeronautics and Astronautics Club
- Amateur Radio Club
- Astronomy Club
- Audio Club
- Behavioral Science Club
- Chinese Language Club
- Computer Forum
- Debate Council and Forum
- Engineering Forum
- Fine Arts Forum
- French Language Club
- Geology Club
- German Language Club
- Mathematics Forum
- Military Affairs Club
- Portuguese Language Club
- Rocket Society
- Russian Language Club
- Spanish Language Club

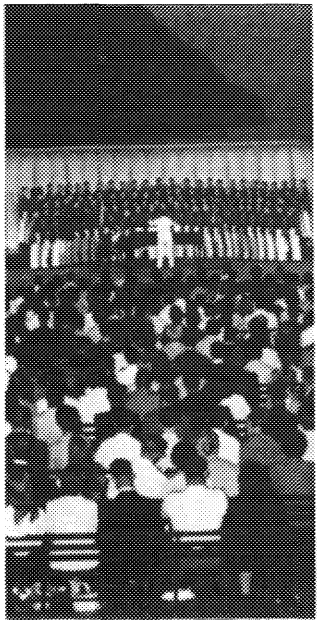
ACADEMY SUPPORT GROUP
- Cadet Glee Club
- Fourth Class Glee Club
- Information Detail
- Public Relations Council
- Scoutmasters' Council

COMPETITIVE ATHLETIC GROUP
- Bowling Club
- Handball Club
- Judo Club
- Karate Club
- Rugby Football Club
- Sailing Club
- SCUBA Diving Club
- Volleyball Club
- Water Polo Club



CORPS SUPPORT GROUP
- *Bugle Notes*
- Cadet Band
- Dialectic Society
- Hop Bands
- Hop Committees (one per Class), Class Committees (one per Class), Ring and Crest Committees (one per Class)
- *Howitzer Year Book*
- *Pointer Magazine*
- Rabble Rousers (Cheer Leaders)
- *Slum and Gravy Magazine*
- WKDT AM/FM Radio Staff

MILITARY SKILLS GROUP
- Mountaineering Club
- Pistol Club
- Riding Club
- Rifle Club
- Skeet and Trap Club
- Sport Parachute Club
- Triathlon Club



RECREATIONAL GROUP
- Chess Club
- Outdoor Sportsman Club
- Ski Club

RELIGIOUS PARTICIPATION GROUP
- Cardinal Newman Forum
- Cadet Chapel Choir
- Cadet Chapel Sunday School Teachers
- Catholic Chapel Choir
- Catholic Chapel Sunday School Teachers
- Fellowship of Christian Athletes
- Jewish Chapel Choir
- Protestant Discussion Group

The clubs under the Academic Group supplement the academic pursuits of cadets. The largest extracurricular activity at West Point is the Cadet Fine Arts Forum. Through a variety of seminars, cadets have the opportunity to expand their interests and academic studies in areas such as archeology, ballet, theater, photography, sculpture and painting. In addition, the Forum sponsors at the Academy many cultural projects to include art exhibitions, classic films, displays, concerts and performances by well-known personalities. Another large and active club is the West Point Debate Council and Forum. Through participation, the future officer gets practice in public speaking and in the art of persuasion. The Student Conference of United States Affairs (SCUSA) held at the Military Academy brings together students and leaders from throughout the United States. The Cadet Band, known to the Corps as the "Rally Band," and a variety of hop combos are popular among those cadets who play musical instruments. For the singers, there are the nationally-famous Cadet Glee Club, the Chapel choirs and the Fourth Class Glee Club. Members of the Cadet Public Relations Council represent the Academy before various civic groups around the country. The Information Detail prepares news items for newspapers, radio and television stations. Cadets teach Sunday School for children of military personnel living at West Point. The Scoutmasters Council annually hosts a Camporee which draws over 3,000 Boy Scouts to West Point.

Literary experience is another aspect of cadet extracurricular activities. Cadets publish their own yearbook, the *Howitzer*;

their own monthly magazine, *The Pointer;* a small handbook called *Bugle Notes* to acquaint Fourth Classmen (Freshman) with customs, traditions, and history of the Military Academy; and *Slum and Gravy,* a monthly sports publication covering all of the Varsity, Intramural, and Club sports. WKDT, the Cadet AM/FM radio station, is fully equipped for voice broadcasting.

The Dialectic Society provides musical and acting outlets for cadets. Highlighting its annual activities is the time-honored "100th Night Show," presented, as the name implies, 100 nights before graduation of the First Classmen. The show is written, produced, and directed by the Cadets, who also provide all the actors.

Student government activities include the Class Committees, Ring and Crest Committee, and the Hop Committees in each class.

Organized extracurricular activities are directed and administered almost entirely by the cadets, subject to the approval of the Commandant of Cadets. There is a volunteer Officer-in-Charge of each activity, who acts in an advisory capacity in addition to his other duties. Participation in these activities provides cadets an opportunity to acquire a wealth of knowledge and to develop leadership and administrative talents which subsequently will serve them well in their careers as Army officers.

There are a number of large, well-equipped cadet reception rooms and lounges for cadets and their guests. Some have fully equipped snack bars, TV rooms, game rooms, and all are normally open on weekends and holidays throughout the year. The Cadet Activities Officer, a member of the Commandant of Cadets Staff, in conjunction with the Cadet Hostess, helps plan the social and recreational programs for the Corps of Cadets. The Cadet Hostess also assists Cadets in obtaining accommodations for their guests during the year.

THE CADET PUBLIC RELATIONS COUNCIL

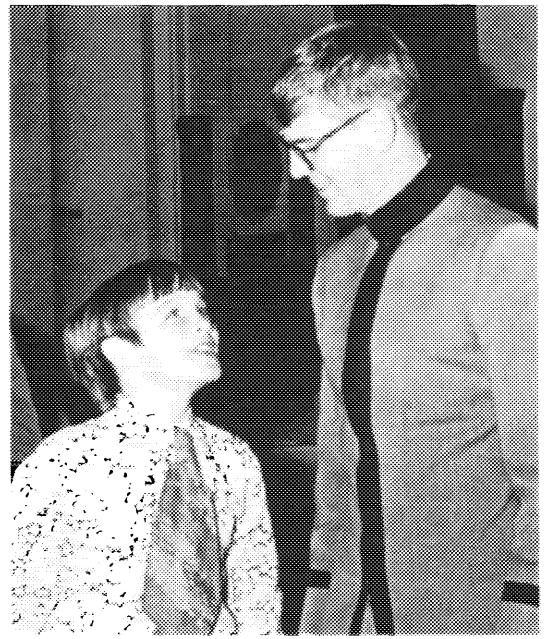
The Cadet Public Relations Council sponsors cadet public appearances (at secondary schools and civic organizations) in conjunction with cadet leave periods. Cadet volunteers talk with students and counselors about admission to, and life at, West Point; they make extensive use of films, slides and other visual aids in their talks and have been widely praised for their professional manner and their ability to relate to secondary school students.

During AY 71-72 cadets made appearances in 3500 high schools and spoke to nearly 700 civic organizations. Cadets also participated in 300 radio and television programs and, in all, reached an audience of more than 5 million people.

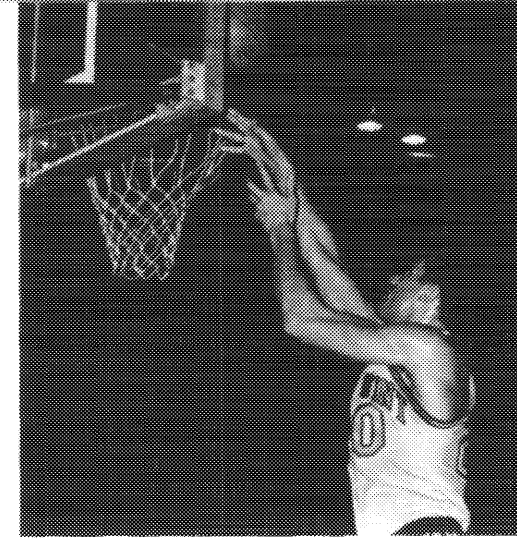
Periods of major activity for the 1972-73 academic year are during Christmas Leave in December, and Spring Leave in March and April.

The council also sponsors visits by cadets to a limited number of special events throughout the school year when those events do not conflict with academic or training requirements and when they demonstrate conclusive admissions support benefit.

Requests for cadet speakers either for a regular program or for a special event must be addressed to Officer in Charge, Cadet Public Relations Council, Admissions, USMA, West Point, New York 10996 (phone 914-938-5117) and must arrive not later than 30 days prior to the proposed engagement.



Intercollegiate Athletics



Athletic Board
BRIGADIER GENERAL JOHN R. JANNARONE,
Chairman
BRIGADIER GENERAL PHILIP R. FEIR
COL JOHN S. B. DICK
COL FRANK J. KOBES
COL WILLIAM J. SCHUDER (Secretary)

Director of Athletics
COL WILLIAM J. SCHUDER,
B.S., United States Military Academy;
M.S., Princeton University

Deputy Director of Athletics for Administration and Logistics
LTC R. H. HOISINGTON,
B.S., United States Military Academy

Deputy Director of Athletics for Business
MAJ WAYNE A. BORGMANN,
B.S., St. Johns, Collegeville, Minnesota

Assistant Director of Athletics
JOHN P. RILEY,
B.A., Dartmouth College

Assistant Director of Athletics
JOHN E. RYAN, JR.,
B.S., M.A., The Ohio State University

Administrative Officer
CPT JAMES H. FLOWERS,
B.S., Trinity University

Assistant Director for Admissions Support
MR. GEORGE STORCK,
B.S., United States Military Academy

COACHING STAFF

Baseball and 150 lb. Football
ERIC TIPTON,
B.A., Duke University

Basketball
DAN DOUGHERTY (Head Coach),
B.S., St. Joseph's; M.A., Villanova
ED HOCKENBURY,
B.S., Boston College

Cross Country and Track
CARLETON CROWELL,
Ph.D., University of Wisconsin

Fencing
JOHN GERACI,
B.S., Newark College of Engineering;
M.S., Brooklyn College

Football
THOMAS B. CAHILL (Head Coach),
B.S., Niagara University
JACK HECKER,
B.S., Bowling Green University
FRED KERN,
B.S., University of Maryland
RICHARD LYON,
B.A., Colgate University;
M.S., Springfield College
JOHN MacKOVIC,
B.A., Wake Forest;
M.Ed., Miami University of Ohio
JOHN McCAULEY,
B.S., Boston College;
M.Ed., Pittsburgh State College

ROBERT M. MISCHAK,
B.S., United States Military Academy
CPT JOHN T. JOHNSON, C Squad (Plebe) Coach,
B.S., United States Military Academy

Golf
NICK KARL,
B.S., Ohio University

Gymnastics
FRANK A. WELLS,
B.S., Panzer College;
M.Ed., Rutgers University

Hockey
JOHN P. RILEY,
B.A., Dartmouth College

Lacrosse
ALFRED F. PISANO,
B.A., Cortland State Teachers College;
M.A., Pennsylvania State University

Pistol
SGM LEONARD ROSS

Rifle
SGM A. O'NEILL

Soccer
JOSEPH PALONE,
B.S., Cortland State College

Squash and Tennis
RON HOLMBERG,
B.A., Tulane University

Swimming
JOHN E. RYAN, JR.,
B.S., M.A., Ohio State University

Wrestling
LEROY ALITZ,
B.S., State College of Iowa;
M.A., University of Iowa

Skiing
SGM HOWARD BROSSEAU (Ret.)

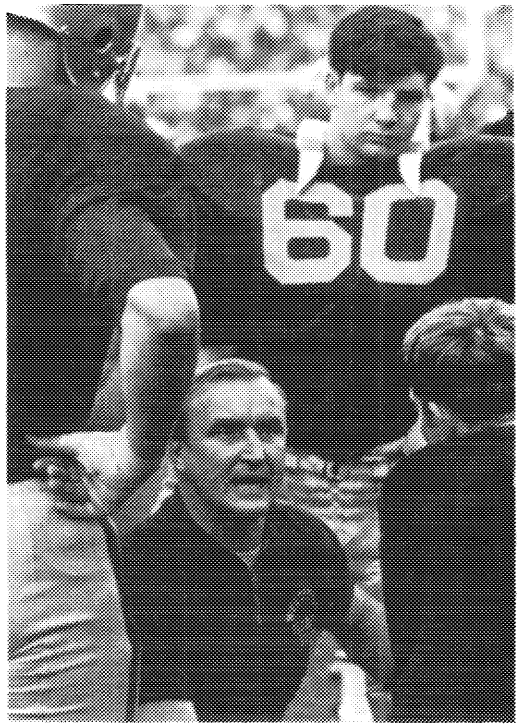
Chief Athletic Trainer
EDWARD PILLINGS,
B.S., B.Ed., Washington State College;
M.A., Columbia University

The Director of Athletics is responsible to the Superintendent for the conduct of the intercollegiate athletic program and the operation of the Army Athletic Association (AAA). The Athletic Board, composed of five senior officers on active duty at West Point, serves as an advisory council to the Superintendent on policies pertaining to intercollegiate athletics. The intercollegiate athletic program is financed by the AAA, which is a self-supporting and nonprofit organization consisting of approximately 14,000 graduates of the Military Academy. No Government funds are appropriated for equipment, maintenance, and operation of the intercollegiate athletic plant.

Army Teams are well known for their great spirit and desire. Nearly half the Corps of Cadets engages in twenty competitive sports: football, 150-pound football, soccer and cross country in the fall; basketball, indoor track, wrestling, skiing, swimming, fencing, gymnastics, hockey, rifle, pistol and squash in the winter; and baseball, lacrosse, track, tennis and golf in the spring.

The Army Football Team is coached by Tom Cahill, who was 1966 Coach of the Year. Each fall, Army plays before capacity crowds against some of the nation's top football teams.

The schedule, which features games with teams from all sections of the country, is capped by the nationally-televised sport spectacular — the Army-Navy Game.



1972 Football Schedule

SEPTEMBER
23 NEBRASKA at West Point
30 TEXAS A&M at College Station, Texas

OCTOBER
7 LEHIGH at West Point
14 PENN STATE at West Point
21 RUTGERS at New Brunswick, New Jersey
28 MIAMI at West Point

NOVEMBER
4 AIR FORCE at West Point
11 SYRACUSE at Syracuse, New York
18 HOLY CROSS at West Point

DECEMBER
2 NAVY at Philadelphia*

* *NAVY is host team.*

Many Army Teams and individual cadets have participated in NCAA National Championships. In addition, the Army basketball team has appeared in the National Invitation Tournament in Madison Square Garden six times in the last nine years, reaching the semi-finals on five occasions. In the three seasons from 1968 to 1970, Army led the entire nation in team defense.

Cadets taking part in intercollegiate athletics are recognized as representatives of the Military Academy and the Corps of Cadets and consequently the teams increase the identity every cadet feels with all athletics. Athletic competition is important in the development of a cadet, and every effort is made to provide excellent facilities, equipment and coaches.

Realizing the value of athletics to the Army, General Douglas MacArthur, who was Superintendent shortly after World War I, reorganized and strengthened the athletic system. "The training of 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," General MacArthur said.

Former President Dwight D. Eisenhower and Generals Omar N. Bradley and James A. Van Fleet are among the many distinguished wearers of the Army "A." Lt. Col. Pete Dawkins was an Army football captain, Heisman Trophy winner, All-American halfback and Rhodes Scholar. The late Lt. Col. Ed White, the first astronaut to walk in space, was a track star at the Military Academy and fellow astronaut, Col. Frank Borman, also won an Army "A."

Office of Institutional Research

Director of Institutional Research
COL GERALD W. MEDSGER,
B.S., United States Military Academy;
M.S., California Institute of Technology;
M.S., New York University

Deputy Director
LTC FELIX L. LIVEOAK,
B.S., United States Military Academy

Chief, Research Division
DR. JOSEPH E. MARRON,
M.A., St. Vincent;
Ph.D., Fordham University

Researchers
MR. CLAUDE F. BRIDGES,
B.S., M.A., University of Florida
DR. RICHARD P. BUTLER,
B.A., Kings College;
M.A., Xavier University;
Ph.D., University of Tennessee

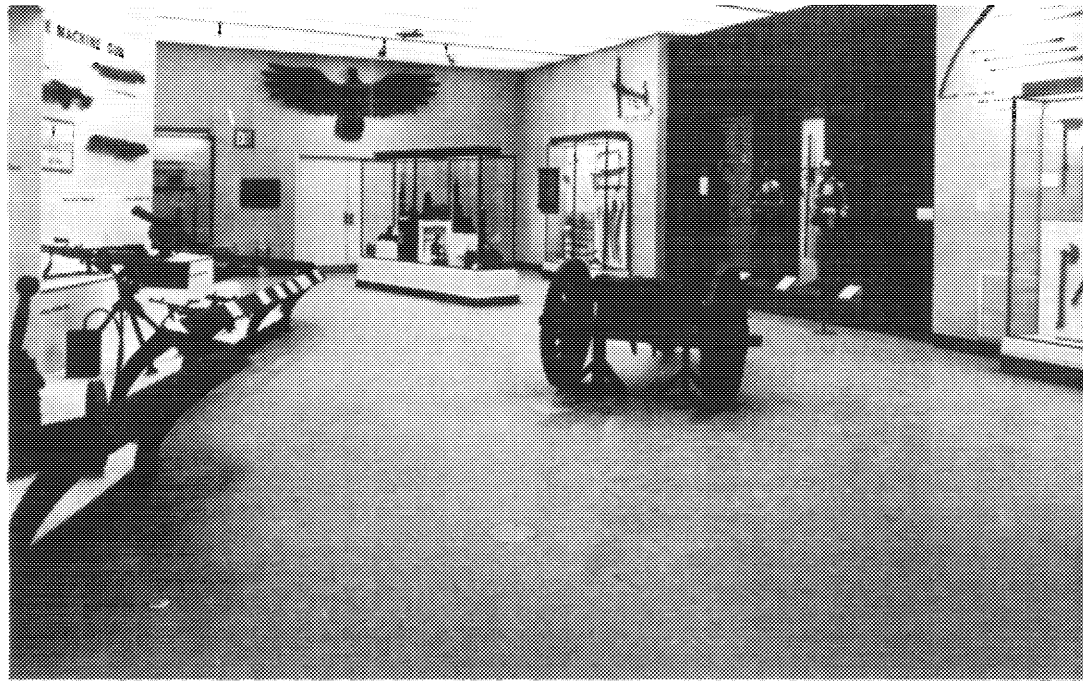
Chief, Data Support Division
MR. DONALD LEECH,
B.S., Geneva College

Chief, Administrative Unit
MR. JOHN W. HOUSTON,
B.S., St. Lawrence University

The Office of Institutional Research, a part of the USMA Special Staff, conducts institutional research projects for the Superintendent and supports institutional research conducted by other activities of the United States Military Academy. The primary research program concerns cadet recruitment and selection, evaluating cadet performance, and doing follow-up studies of graduate performance. Specifically, the program includes a continual evaluation of admissions criteria as they are related to cadet performance, studies of changes in cadet interests, values and motivation of cadets while at the Academy, analysis of environmental forces at the Academy, and studies of the impact of the Academy on the success of the graduates. The Office also conducts smaller applied research studies into other appropriate areas of inquiry to answer specific questions.

The Office of Institutional Research maintains a central library of institutional research completed at the United States Military Academy and acts as a clearing house for this information. The Office maintains a central file of information regarding candidates, cadets and graduates; and provides technical assistance and services to officers, cadets, and other researchers at the Academy. Cadets with curricular or other requirements involving research are authorized to seek assistance from the Office in accordance with guidelines established by the department concerned.

The Museum



Director
MR. RICHARD E. KUEHNE,
B.A., Amherst College

Curator of Design
MR. RAY W. MONIZ,
B.F.A., Syracuse University

Museum Curators
MR. ROBERT W. FISCH
MR. MICHAEL J. McAFEE,
B.A., M.A., Ohio University

Museum Specialist
MR. WALTER J. NOCK,
B.A., Fairleigh Dickinson University

Administrative Assistant
MRS. LEONA P. PATTON

The West Point Museum occupies the first and second floors of the southwest portion of Thayer Hall, one of the main academic buildings. Its galleries and special displays are open without charge to the public daily, from 10:30 a.m. to 4:20 p.m. throughout the year. The Museum is closed only on Christmas and New Year's Day.

Adjacent to the public galleries are storage and research rooms maintained by the Museum to carry out its primary duty of supporting the academic and military education of the cadets. To this end it maintains a continuous series of changing exhibits in cadet areas, arranges lectures and

demonstrations, and opens its collections for loans to instructors and cadets. It maintains a considerable display of portraits and paintings, battle flags and other exhibits in various buildings on the post. Some of these paintings and flags can be seen by the public in the Library, the Cadet Chapel, and in Grant Hall.

The West Point Museum was established in 1854; its collections date back to 1777. After the Battle of Saratoga in October 1777, much of the ordnance captured from the British was sent to West Point. Part of the famous Great Chain which stretched across the Hudson at West Point to bar navigation of the river to British men-of-war was also stored here.

Throughout the first half of the 19th century, the custom of sending trophies of war and objects of national historic interest to the Military Academy was maintained. In 1843, for example, the Secretary of the Treasury presented West Point with a brass culverin six pounder that had been given to the Continental Congress by Lafayette. After the close of the Mexican War in 1847, Gen. Winfield Scott sent large numbers of captured flags, cannon, and other war trophies to the Military Academy. In 1848, the Secretary of War formally directed, in the name of the President, that West Point be the "depository of the trophies of the successful victory of our arms in Mexico."

West Point authorities realized that permanent provision was needed for the growing collections, and, in 1854, officially created the Ordnance and Artillery Museum, establishing it on the third floor of the Academy, a building erected in 1838 on the site of the present East Cadet Barracks. Custodianship of relics, however, was not the new museum's only mission; for most of the next century it served as the laboratory for cadet instruction under the Department of Ordnance.

In 1909, the Museum was moved to the Administration Building where it remained until 1958. It was removed from the Department of Ordnance in 1948 and was given independent status. A full-time director was appointed in 1949 and was assigned a professional staff.

The West Point Museum has, perhaps, the largest collection of military items in the Western Hemisphere. Unlike most military museums, the story it tells is not confined to a national one. One gallery is devoted to the development of military instruction and the art of war from the days of the Romans to the present; others deal with ordnance, logistics, medals and decorations and kindred aspects of the military history of the Western World. The visitor is introduced to the important developments in tactics, to the Great Captains of History, and to the everyday-life of the soldier.

The museum contains extensive dioramas and full scale models. The visitor can stand behind a palisade of the days of the Indian Wars in America, or see a portion of a World War I trench. He can view episodes in important battles from Cynoscephalae (197 B.C.), to Gettysburg (1863). In keeping with developments in other American museums, the West Point Museum has endeavored to fulfill its historical mission by portraying intangible cultural concepts and movements as well as tangible realities.

Admissions

Director of Admissions and Registrar
COL MANLEY E. ROGERS,
B.S., United States Military Academy;
M.S.C.E., California Institute of Technology

Deputy Director of Admissions
MR. JOHN I. WOODRUFF

Associate Director for Admissions
LTC CHARLES WATKINS,
B.S., United States Military Academy;
M.S., Georgia Institute of Technology

Admissions Officers
MAJ DAVID E. ROESLER,
B.S., United States Military Academy
CPT GEORGE R. BROCK,
B.S., United States Military Academy;
M.B.A., University of Maryland
CPT WILLIAM L. ENGLAND,
B.S., Tuskeegee Institute;
M.A., Butler University
CPT FREDERICK ERNST,
B.S., United States Military Academy;
M.S.C.E., Stanford University;
M.S.M.E., Stanford University
CPT ARTHUR C. HESTER,
B.S., United States Military Academy;
M.S., Stanford University
CPT LEO R. KENNEDY,
B.S., United States Military Academy;
M.Ed., University of Illinois
CPT FRANKLIN P. LAMBERT,
B.S., United States Military Academy;
M.Ed., University of Illinois
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M.B.A., Ohio State University
CPT GEORGE NORTON,
B.S., United States Military Academy;
M.Ed., University of Illinois
CPT RONALD L. WALTER,
B.S., United States Military Academy;
M.A., University of Illinois
CPT MICHAEL E. WIKAN,
B.S., United States Military Academy;
M.S., University of Michigan

Associate Director for Candidate Advisory Services
MAJ PIERCE A. RUSHTON,
B.S., United States Military Academy;
M.S., University of Alabama

Associate Director for Data Processing
MAJ JOHN C. WINKLER,
B.S., United States Military Academy;
M.B.A., University of Georgia

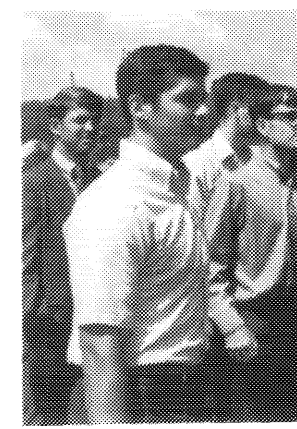
Assistant Director of Admissions for Field Support Programs
MAJ ROBERT B. TURNBULL, (Ret.),
B.S., United States Military Academy

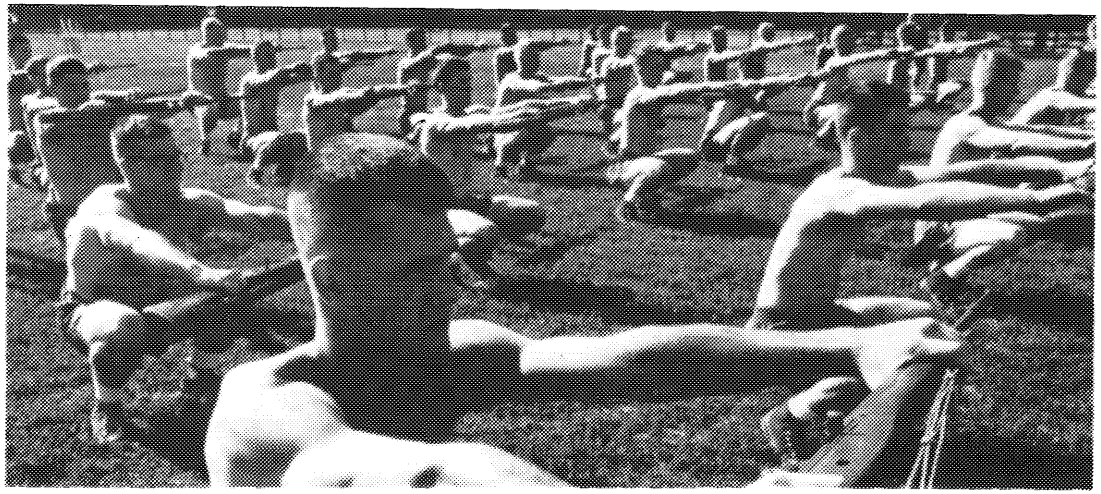
Reserve Affairs Advisor
LTC HAROLD G. BEAL, JR.,
B.A., Fordham College;
M.A., Columbia University

Admissions Publications and Public Relations
MR. KENNETH M. PETRACK,
B.A., Duquesne University;
M.A., Duquesne University (1964);
M.A., Duquesne University (1966)

1LT PAUL A. DAVIS,
B.F.A., University of Kansas;
M.F.A., University of Kansas

Candidate Testing Coordinator
MR. JAMES L. GAINES





ADMISSIONS PROCEDURE GUIDE

All prospective candidates should read the admissions material carefully. The following is provided as a guide to assist prospective candidates.

1. Check the eligibility requirements cited below to see if you can qualify.
2. Study the criteria for the various nominating categories and make application for all those for which you are eligible using the sample formats shown below.
3. If you are at least a high school junior, complete a Prospective Candidate Questionnaire which may be obtained by writing to Admissions, USMA, West Point, New York 10996. Have your guidance counselor forward it to Admissions, USMA, so that a prospective candidate admissions file may be started on you.
4. Arrange for and complete *either* the American College Testing (ACT) Assessment Program test *or* the College Entrance Examination Board (CEEB) tests (SAT, English Composition and Mathematics Achievement), following the procedure outlined in the Academic Qualification section below.
5. Complete a Qualifying Medical Examination as directed by the Service Academies Central Medical Review Board.
6. Upon receipt of instructions from Admissions, USMA, complete the Physical Aptitude Examination.
7. Insure that all forms received from Admissions, USMA, and The Adjutant General, Department of the Army, are completed and returned promptly.
8. After completing all examinations and requirements, await notification of your admission status.
9. In the event that you are not selected for admission, you may request consideration for attendance at the United States Military Academy Preparatory School; write to the Director of Admissions, USMA, West Point, New York 10996, prior to 15 April 1973. Annually, approximately 100 candidates are enlisted into the Army for attendance at the Preparatory School.

Entrance Requirements

In order to qualify for admission the candidate must be qualified academically, medically, and in physical aptitude. Additionally, he must meet certain general requirements specified by public law.

Age: On 1 July of the year he is to be admitted, a candidate must have attained the age of 17 years and must not have reached the age of 22.

Citizenship: A candidate must be a citizen of the United States at the time of enrollment. (Foreign students nominated by mutual agreement between the United States and the countries concerned are exempt from this requirement).

Marital Status: A candidate must never have been married nor may he marry while a cadet.

Character: Each candidate's record should show positive evidence that he is responsible, trustworthy, emotionally stable, and of good moral character.

Motivation: Motivation is one of the most important determinants of success and also the most difficult factor to measure. It is normal that some applicants may not be certain whether or not they desire to follow a lifetime career in the Regular Army; however, all nominees should possess the determination and pride of accomplishment necessary to surmount the challenges encountered at the Academy and during the five-year tour of obligated service after graduation.

QUALIFICATIONS

Academic Qualification

A candidate's academic qualification is determined by considering the following:

1. His entire scholastic record in secondary school (and college, if appropriate) to determine that he has the aptitude and demonstrated capability to succeed in the demanding curriculum required of all cadets.
2. His performance on either of the following:
   a. The College Entrance Examination Board (CEEB) tests
      Scholastic Aptitude Test
      English Composition Achievement Test
      Level I or II Mathematics Achievement Test*
   b. The American College Testing (ACT) Assessment Program Test
3. Recommendations from the principal, counselors, teachers, and other officials in a position to judge accurately the academic performance and potential of the candidate.

**Scores on either the Level I or Level II Mathematics achievement test will be accepted by the Military Academy. No adjustment is made for any difference in the degree of difficulty of the two tests.*

ACT OR CEEB TESTS

All candidates for admission to West Point must take either the American College Testing (ACT) Assessment Program or the College Entrance Examination Board (CEEB) tests.

ACT

The ACT is administered at test centers throughout the world. The testing fee is $6.50, and advance registration of several weeks is required. For information on ACT testing in your locale, consult any high school counselor or write directly to:

ACT Assessment Program
Records Department
P.O. Box 168
Iowa City, Iowa 52240

The candidate is responsible to assure that ACT forwards his test results to West Point and to his Congressman. List the ACT college code number for USMA **(2976)** on your answer sheet. After taking the test, write to: ACT Assessment Program, Records Department, Box 451, Iowa City, Iowa 52240, requesting that the score report be sent to your Congressman—list his title, name and address; list your name, social security number, birth date, date of testing and test center; include fee ($2.00 for each Congressional addressee).

American College Testing (ACT) Assessment Program Dates for 1972-1973

TEST DATE	REGISTRATION OPENS	REGISTRATION CLOSES
July 15, 1972	April 5, 1972	June 19, 1972
October 21, 1972	August 21, 1972	October 2, 1972
December 9, 1972	October 9, 1972	November 13, 1972
February 24, 1973	November 27, 1972	January 29, 1973

THE FINAL DATE FOR TAKING THE ACT TEST FOR WEST POINT IS FEBRUARY 24, 1973.

CEEB

All candidates taking the CEEB exams for admission are required to take the SCHOLASTIC APTITUDE TEST, the ENGLISH COMPOSITION and the MATHEMATICS (Level I or Level II) ACHIEVEMENT TESTS of the College Entrance Examination Board.

The College Board has established examination centers throughout the world. To take these tests, you are required to register in advance (preferably 7 weeks) with the College Entrance Examination Board Office. If you desire to take the tests in Montana, Wyoming, Colorado, Oklahoma, Arkansas, Texas and states further west, you should apply to the College Entrance Examination Board, Box 1015, Berkeley, California 94701. To take the examinations in any other state you should apply to the College Entrance Examination Board, Box 592, Princeton, New Jersey 08540. For testing details applicable to your specific needs, consult any local high school counselor. Fees for the tests, payable to the Board are: $6.50 for the Scholastic Aptitude Test; $10.50 for the two Achievement Tests. All applications and fees should reach the office of the College Board at least five weeks before the date of the examination. It is the candidate's responsibility to assure that the College Board forwards his test results to West Point and to his Congressman.

The CEEB college code number for West Point is **R2924.** For reporting scores to your Congressman, list, on the transcript request form, his title, name, and address.

College Entrance Examination Board (CEEB) Dates for 1972-1973

TEST DATE	REGISTRATION PENALTY DATE	REGISTRATION CLOSING DATE
July 8, 1972	June 7, 1972	June 21, 1972
October 14, 1972 *(SAT in Calif & Texas only)*	September 25, 1972	September 25, 1972
November 4, 1972 *(SAT only)*	October 2, 1972	October 12, 1972
December 2, 1972	October 26, 1972	November 9, 1972
January 13, 1973	December 7, 1972	December 21, 1972

THE FINAL DATE FOR TAKING THE CEEB TESTS FOR WEST POINT IS JANUARY 13, 1973.

If extenuating circumstances preclude completion of the CEEB test series by the January date, or the ACT by the February date, write Admissions, USMA, West Point, New York 10996, explaining the circumstances and stating your plans for completing the testing requirement. Final admissions decisions will be made in April 1973 from the data then present in each file.

Physical Aptitude Qualifications

Each candidate is required to establish his qualification in Physical Aptitude. Qualification is determined by an examination designed by the Military Academy to measure strength, coordination, muscular power, endurance, and agility.

Qualification is determined on the basis of total performance in four physical performance items (see Appendices for test items). A poor performance on a single item will not necessarily result in disqualification.

A candidate previously qualified in physical aptitude (during an earlier testing cycle) is not required to reestablish his qualification during the current year. However, a candidate is advised to retake the test, as a higher score will improve his chances of appointment.

Candidates are advised to prepare for this examination by engaging in vigorous activities such as running, general conditioning exercises, and competitive games rather than by practicing specific test items.

The Physical Aptitude Examination is identical for all the Service Academies. If the examination is administered by another Service Academy, it is the candidate's responsibility to have the results forwarded to the Director of Admissions at West Point.

The only acceptable substitute for the Physical Aptitude Examination is the Motor Performance Test, a version of the PAE to be administered at a candidate's school. The Motor Performance Test is administered to those candidates who are unable to attend candidate testing at one of the test sites and is administered at the direction of the Admissions Office, USMA.

Medical Qualification

To qualify for admission with the Class of 1977, the candidate must undergo a Qualifying Medical Examination between 1 June 1972 and 1 July 1973. Only one Qualifying Medical Examination is required, regardless of the number of service academies to which he applies or the number of nominations he receives.

PROCEDURES

The Qualifying Medical Examination is scheduled at a federal medical facility by the Service Academies Central Medical Review Board (SACMRB), at the request of (1) a sponsoring Member of Congress, or (2) the Military Academy after a candidate has opened his Admissions file. A letter containing the location, date and time for the Qualifying Medical Examination is provided by the SACMRB. Travel and personal expenses incurred in taking the examination are the responsibility of the candidate. All completed examination forms and records are sent by the medical facility to the SACMRB, which evaluates the examination and notifies the Military Academy of the results. USMA Admissions notifies both the candidate and the Member of Congress of the results.

The candidate may desire to be checked by his family physician and dentist for

obviously disqualifying defects. For this purpose, USMA medical requirements are listed in the Appendix.

EVALUATION

Medical qualification for admission is determined by the Service Academies Central Medical Review Board; the medical facility administering the examination does not have the authority to determine medical qualification for any candidate. If a candidate is found disqualified for a non-remedial condition, no further testing for the Military Academy is authorized. If the disqualification is remedial, the candidate will be notified by the SACMRB of the corrective measures required before reexamination. Minor disqualifying defects are automatically considered for waiver for the candidate who otherwise possesses outstanding qualifications; the candidate should not request waiver consideration. All inquiries concerning medical qualification should be addressed to the Director, Service Academies Central Medical Review Board, U. S. Academy, Colorado 80840.

The Qualifying Medical Examination is the same for all service academies, although each academy's qualification standards differ somewhat based on the commissioning requirements of the individual Military Services. The Service Academies Central Medical Review Board evaluates and files all candidate medical examination results; thus, when a candidate completes a medical examination, the results are provided to any service academy to which he applies.

CADETSHIPS AND NOMINATIONS

Each cadetship at the Military Academy is allocated by law to the Vice President, a specified Member of Congress, the Governor or Commissioner of a U.S. Territory, the Delegate to the House of Representatives from Washington, D.C., or the Secretary of the Army. When a cadetship becomes vacant due to graduation or other causes, the nominating authority nominates individuals to fill the vacancy. The congressional authority to whom a vacancy is allocated transmits to the Department of the Army the names of up to ten young men to fill the vacancy and indicates the method to be used in selecting the candidate to the cadetship.

CONGRESSIONAL CADETSHIPS

Vice-President	5
100 Senators (5 each)	500
435 Representatives (5 each)	2175
Mayor of The District of Columbia	5
Canal Zone Governor	1
Puerto Rico Resident Commissioner/Governor	6
Guam, Virgin Islands, American Samoa Governors	1
Total	2693

CONGRESSIONAL NOMINATIONS

The Vice President nominates from the United States at large. United States Senators and Representatives-at-Large nominate from their respective states at large. U.S. Representatives, other than those elected at large, nominate from their districts. The Delegate to the House of Representatives from the District of Columbia nominates from among the residents of

the District. The Governor of the Canal Zone nominates from among the sons of civilians residing in the Canal Zone and from among the sons of civilian personnel of the U.S. Government and the Panama Canal Company residing in the Republic of Panama. The Governor of Puerto Rico must nominate a native of Puerto Rico to fill his single cadetship. The Resident Commissioner nominates from among residents domiciled in Puerto Rico to fill the five cadetships allocated to him. The Governors of Guam, of the Virgin Islands and of American Samoa nominate from among the sons of U.S. citizens or nationals residing on their respective Islands.

As most Congressional authorities conduct interviews and tests before selecting their nominees, it is important that a young man interested in entering the Military Academy apply for consideration to his authorized nominating sources at least one year prior to the time he expects to enter the Academy (July).

Congressional nominating authorities specify to the Department of the Army the method to be used in making the final selection of the candidate to fill the vacant cadetship. The most common methods are described below.

CONGRESSIONAL COMPETITOR: In this method the Member of Congress submits his slate of nominees as competitors. The Academy evaluates all nominees competing for the vacancy and rank orders them. The best qualified candidate is then selected to fill the vacancy.

PRINCIPAL WITH COMPETING ALTERNATES: In this method the Member of Congress designates a principal nominee and, should the principal be disqualified, allows his alternates to compete for the vacancy.

PRINCIPAL-ALTERNATE: In this method the Member of Congress designates a Principal and nine Alternates. The Academy must first evaluate the principal nominee, and, if fully qualified, he is accepted to fill the vacancy. If the principal nominee is disqualified, each alternate, in designated succession, is evaluated until one is found fully qualified.

HOW TO APPLY FOR A CONGRESSIONAL NOMINATION

As a minimum, you should apply to your two United States Senators and your Representative in Congress, using the following format.

This format is intended as a guide. A separate letter must be sent to each Senator and Representative to whom you apply.

Request for Congressional Nomination FORMAT

Date _____

Honorable _____ House of Representatives Washington, D.C. 20515 Dear Mr. _____	OR	Honorable _____ United States Senate Washington, D.C. 20510 Dear Senator _____

I desire to attend the United States Military Academy and to be commissioned in the Regular Army. I respectfully request that I be considered as one of your nominees for the class entering West Point in July 1973.

The following data are furnished for your information:

Name: _____

Permanent Address: _____

Telephone Number: _____

Temporary Address and telephone number
(if different from preceding): _____

_____

Date of Birth: _____

High School: _____

Social Security Number: _____

Names of Parents: _____

I have/have not requested that a prospective candidate file be initiated for me at the West Point Admissions Office.

Sincerely,

MILITARY SERVICE CONNECTED NOMINATIONS

Presidential

The Presidential category is reserved by law for the sons of career military personnel of the Army, Navy, Air Force, Marine Corps and Coast Guard, whether active, retired or deceased.

The term career includes members of the Reserve Components currently serving eight years or more of continuous active duty (other than active duty for training) and retirees receiving either retired or retainer pay. Note: Sons of Reservists retired while *not* on active duty are ineligible. These nominations are administered in Headquarters, Department of the Army. Interested young men should make application by letter to The Adjutant General, HQDA (DAAG-PSA-M), Forrestal Building, Washington, D.C. 20314, no later than 15 December.

An adopted son is eligible if he was adopted prior to his 15th birthday: a copy of the order of court decreeing adoption, duly certified by the clerk of the court, must accompany the application.

Regular Army

Nomination of candidates to fill the annual vacancies authorized for members of the Regular Army is outlined in AR 351-12. This publication may be obtained from the nearest Army installation; by writing to HQDA (DAAG-PSA-M), Forrestal Building, Washington, D.C. 20314; or by writing to Admissions, USMA, West Point, N. Y. 10996. All Regular Army nominees are required to attend the USMA Preparatory School at Fort Belvoir, Virginia, during the year prior to entering the Military Academy.

Army Reserve/National Guard

Nominations to fill the annual vacancies authorized for members of the Reserve and National Guard are outlined in AR 351-12. This publication may be obtained from the nearest Army installation; by writing to HQDA (DAAG-PSA-M), Forrestal Building, Washington, D.C. 20314; or by writing to Admissions, USMA, West Point, N. Y. 10996.

Sons of Deceased and Disabled Veterans

Cadetships are provided for the sons of deceased Armed Forces personnel who were killed in action, or died of wounds or injuries received, or disease aggravated by active service; or have a service-connected disability rated at not less than 100 per cent resulting from wounds or injuries received or diseases contacted in active service, or pre-existing injury or disease aggravated by active service; or for sons of military personnel or federally employed civilians who are now in a missing or captured status as a result of the current conflict in Southeast Asia. The Veterans Administration determines eligibility and its decisions are final and binding on the Department of the Army. Application should be made by letter addressed to The Adjutant General, HQDA (DAAG-PSA-M), Forrestal Building, Washington, D.C. 20314. Application must be made prior to 15 December. The letter of application should state the full name, date of birth, and address of the applicant (complete service address should be given if the applicant is in the Armed Forces); and the name, grade, service number, and last organization of the veteran parent, together with a brief

statement concerning the time, place, and cause of death, details of disability, or details of missing or captured status, as appropriate. The claim number assigned to the veteran parent's case by the Veterans Administration must also be furnished.

Army ROTC

Any applicant who is enrolled in a recognized Army Reserve Officer Training Corp program — either junior or senior division — is eligible for a nomination. Applications are accepted from the beginning of each academic year until 15 December. To apply, a candidate should contact the Professor of Military Science or Senior Army Instructor at his school. Recommendation forms are provided to ROTC units in the early fall and upon request during the academic year.

In addition, any ROTC school/unit designated as an Honor Unit with Distinction by Department of the Army General Orders covering the current year is authorized to recommend three "honor graduates" for nominations under a separate ROTC Honor Military category. Application procedures are the same as for other ROTC nominations. A candidate, however, may receive only one ROTC nomination during any admissions cycle; i.e., he may have either an ROTC nomination or an ROTC Honor Military nomination. Cadetships will be filled on a best qualified basis without regard for the schools from which nominations were made.

Sons of Persons Awarded the Medal of Honor

Sons of recipients of the Medal of Honor may be nominated and appointed to the Military Academy. The administration of these nominations is in the Department of the Army. Application by those eligible should be made by letter to The Adjutant General, HQDA (DAAG-PSA-M), Forrestal Building, Washington, D.C. 20314. The letter should contain the applicant's full name, address, and date of birth (complete service address should be given if the applicant is in the Armed Forces); the name, grade, and branch of service of the parent; and a brief statement of the date and circumstances of the award. There is no limitation upon this category and all candidates who are found fully qualified will be admitted as cadets.

HOW TO APPLY FOR A SERVICE-CONNECTED NOMINATION

As a minimum you should apply under each military service-connected nomination for which you are eligible using the following format.

This format is intended as a guide.

Request for Service Connected Nomination FORMAT

Date _____

The Adjutant General
HQDA (DAAG-PSA-M)
Forrestal Building
Washington, D.C. 20314

Dear Sir:

I request a nomination under the ..... category for the class entering the United States Military Academy in July 1973 and submit the following data:

Name of Applicant: _____

Address: _____

Telephone Number: _____

Date of Birth: _____

Social Security Number: _____

Name of Parent: _____

Military Rank of Parent: _____

Service Number of Parent: _____

Component and Branch of Service of Parent: _____

Parent Retired or Deceased: (furnish date and copy of retirement order or casualty report)

(Include a brief statement concerning the date, place and cause of death or the details of disability together with the claim number assigned to the veteran parent's case by the Veterans Administration [if appropriate].)

(Include a brief statement of the date and circumstances of the award of the Medal of Honor [if appropriate].)

Sincerely,

(Enlisted applicants are referred to AR 351-12 dated 10 June 1969.)

MILITARY SERVICE CONNECTED CADETSHIPS

The Secretary of the Army's annual allocation of cadetships is distributed to the following specific categories:

Presidential	100
Enlisted Members of the Regular Army	85
Enlisted Members of the Army Reserve/National Guard	85
Sons of Deceased and Disabled Veterans	approximately 10
Honor Military, Naval Schools and ROTC	20
Sons of Persons Awarded the Medal of Honor	Unlimited

Appointments to vacancies within each of the Army categories are awarded to the best qualified candidates within each category on a competitive basis. A detailed discussion of the competitive nomination categories follows.

ALLIED CADETS

Young men from the allied countries listed below may be designated by their governments to take the entrance examinations and, if qualified, be authorized to receive instruction at the Military Academy. Requirements for the admission, advancement from class to class, and graduation of allied cadets are the same as those for cadets of the United States. While a cadet, they receive the same pay and allowances as cadets appointed from the United States. They are not entitled, however, by reason of their graduation, to appointment in the Armed Forces of the United States.

Republic of the Philippines. One Philippine National, from among those designated by the President of the Republic of the Philippines, selected on the basis of his academic record and College Board test scores, is authorized to enter with the new class each July.

American Republics. A total of not more than 20 citizens of the American Republics may receive instruction at the Military Academy at any one time. Selection will be determined in the same manner as for nominees from the Republic of the Philippines. Not more than three persons from any one country may be cadets at the same time.

NOTIFICATION

The results of the individual's Medical Examination will be forwarded to the nominating authority and to the candidate as soon as the evaluation is complete.

Early Decision: At least 200 fully qualified outstanding candidates will receive an offer of admission beginning 15 October. This notification is made without regard to type nomination. Candidates who desire an early decision should inform Admissions, USMA, in writing and should complete all testing by 2 December.

Qualified principal nominees and other outstanding candidates will be offered admission as their records become complete.

All other qualification determinations will be dispatched beginning 1 April. Final admissions decisions will be made in April 1973 from the data then present in each file.

Since some selected candidates will decline their offer of admission, additional qualified candidates will be selected as required. Thus, a few candidates will not be notified of their selection for admission until shortly before the entry date of 2 July. Offers of admission are conditional from the time of offer to date of admission.

PREPARATION

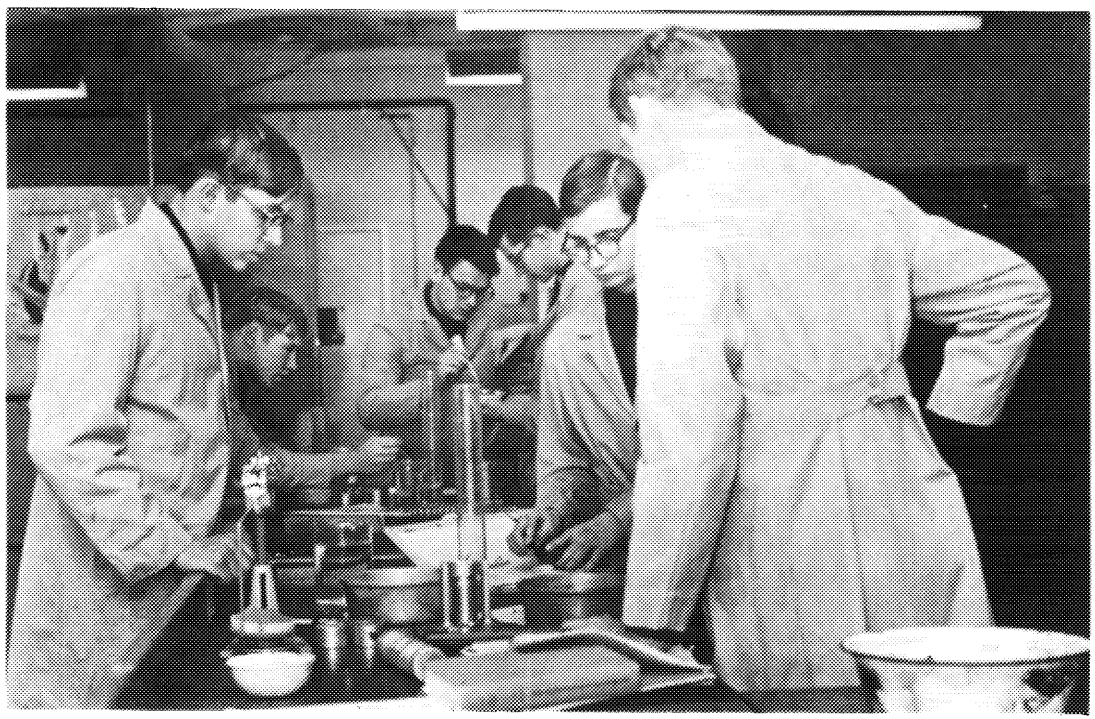
Academic

A sound secondary-school academic background is essential for a candidate to successfully complete the academic program offered at West Point. The academic pace is rapid and a thorough foundation in secondary-school subjects is assumed.

West Point does not require a specific number of courses or units of study, nor are there cut-off scores on the American College Testing (ACT) Assessment Program or the College Entrance Examination Board (CEEB) tests. Above average grades in secondary-school subjects, and on the ACT or CEEB tests, obviously will enhance a candidate's chances for admission.

In order to prepare adequately for the required ACT or CEEB tests, and to provide the necessary academic foundation for the West Point curriculum, a candidate should complete the following secondary-school courses:

English Four years, emphasizing American and English literature, composition and grammar, oral communication, and



reading with reasonable speed and comprehension.

Mathematics Three years, including algebra, plane geometry (and fundamentals of solid geometry) and trigonometry. A fourth year of college preparatory mathematics is recommended.

Foreign Language Two or three years, preferably in one of the foreign languages offered at West Point.

Basic Sciences Standard courses in physics and chemistry, to include laboratory work. Additional courses in the sciences are desirable.

Social Sciences A standard American history course is recommended. Additional American or European history, geography, government, and economics courses are helpful.

Candidates who have successfully completed college level courses, or who have attended college prior to entering West Point, and can demonstrate adequate proficiency may validate similar courses in the Academy curriculum. Following admission, a cadet may qualify for accelerated or additional courses, based upon the requirements of the individual academic departments. Candidates are urged to take the College Entrance Examination Board Advanced Placement Examinations for those courses they desire to validate.

Physical

In order to prepare adequately for the Physical Aptitude Examination and for the physical demands placed upon the cadet, candidates are urged to attain the state of physical conditioning required for participation in a strenuous team sport. Vigorous conditioning exercises, cross country running and swimming are recommended. Emphasis should be placed upon a variety of strenuous activities rather than on one sport. A candidate should be able to swim and should have attained a high state of physical conditioning prior to entering West Point.

Leadership

A candidate should strive to develop the personal traits which mark him as a leader in school and community activities. A young man who is respected by his associates for his contributions to school and community affairs, and can subordinate his personal desires to group goals, has displayed leadership potential. Participation in secondary school extra-curricular activities, both athletic and non-athletic, and the attainment of responsible positions in these activities, provide valuable leadership experience. Candidates should strive to make significant contributions in leadership positions on athletic teams, in club and class activities, and in civic and community activities.

The candidate who must work to provide family financial support has also demonstrated leadership potential. In the West Point admissions procedure this candidate is not penalized because he cannot participate in extracurricular activities.

Oath of Allegiance

Candidates admitted to West Point will join the Corps of Cadets on 2 July 1973. They will be required to sign the Oath of Allegiance, a copy of which appears on the facing page.

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. Engagement for Service

I, having been appointed a cadet of the United States Military Academy, do hereby engage, with the consent of my parents or guardian if I am a minor, unless sooner separated from the Academy:

a. To complete the course of instruction at the United States Military Academy.

b. If tendered an appointment as a commissioned officer in a Regular component of one of the armed services upon graduation from the United States Military Academy, to accept such appointment and to serve under such appointment for not less than five consecutive years immediately following the date of graduation.

c. If an appointment as provided in IIb above is not tendered, or if permitted to resign my commission in a Regular component of one of the Armed Services prior to the sixth anniversary of my graduation, to accept an appointment as a commissioned officer in a Reserve component of one of the Armed Services and remain therein until such sixth anniversary.

III. Marital Status

I am not married and never have been married.

IV. I have read and understand the following policy applicable to Cadets who are separated prior to graduation:

a. A cadet who enters the United States Military Academy directly from a civilian status assumes a military service obligation of six years (10 USC 651).

b. A cadet who enters the Academy from a civilian status and resigns or is separated prior to the commencement of his Second Class academic year will be discharged from the Army in accordance with current regulations of the Army. A resignation tendered by a Fourth or Third Classman will be accepted when found to be in the best interests of the service.

c. A cadet who enters the Military Academy from the Regular or Reserve Component of any military service and resigns or is separated from the Military Academy prior to the commencement of his Second Class academic year normally will revert to his former status for completion 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 (10 USC 516(b)). However, completion or partial completion of a prior service obligation by a separated cadet who entered from this status in no way exempts him from transfer to a Reserve Component and order to active duty pursuant to 10 USC 4348 (b).

d. With the commencement of the Second Class academic year, a Second or First Classman who resigns or is separated prior to completing the course of instruction, except for physical disqualification, unfitness or unsuitability, normally will be transferred to the Reserve Component in an enlisted status and ordered to active duty for not less than two years (10 USC 4348(b)). When separation occurs as a result of deficiencies which are not considered willful, the active duty provision may be waived.

e. Any First Classman who completes the course of instruction and declines to accept an appointment as a commissioned officer will be transferred to the Reserve Component in an enlisted status and ordered to active duty for four years (10 USC 4348(b)).

f. A cadet who tenders a resignation will be required to state a specific reason for his action. Cadets separated from the Military Academy because of physical disqualification or demonstrated unsuitability or unfitness for military service will be discharged in accordance with criteria established by current Army regulations.

g. In each case where a cadet is separated from the Military Academy, the Director, Selective Service System will be notified of the individual's change in status.

USMA PREPARATORY SCHOOL

The United States Military Academy Preparatory School (USMAPS), located at Fort Belvoir, Virginia, 16 miles south of Washington, D.C., prepares and trains selected Army enlisted men to successfully compete for admission to West Point.

The Preparatory School operates on a 10 month school year, from August through May. During this time, candidates are prepared for entrance to the Academy through exposure to intensive academic, physical, and military training. Additionally, candidates are encouraged to participate in extracurricular, athletic and other student activities.

The academic program, consisting of English and mathematics, is sub-divided into two courses: the *preparatory course* and the *advanced course*. The preparatory course is a comprehensive review of high school English and mathematics including English literature, basic writing and speaking, algebra, and geometry. The advanced course is an introduction to college level English composition, American literature, plane and spherical geometry, solid and analytical geometry, and advanced and matrix algebra.

Candidates are fully prepared for the Physical Aptitude Examination and the rigorous physical life they will encounter at the Military Academy. Through scheduled physical training and an extensive sports program, the candidates gradually build themselves into confident and well-conditioned young men. USMAPS currently offers varsity competition in eleven sports, while twelve sports are offered at the intramural level.

A limited amount of time is devoted to formal military training. The "Prepster," an enlisted man who has completed all or a major portion of basic training, is well prepared to adapt to the school's requirements. An evaluation system, consisting of tactical, academic and peer ratings, plus frequent counseling by the staff assists candidates in preparing for further training and eventual cadet life at West Point. A wide variety of extracurricular activities are available including ski, skeet and photo clubs; a school newspaper, social, and yearbook committees; post athletic teams and religious groups; and, of course, dances, picnics, and other social engagements with young ladies from local girls schools and colleges. The proximity of the Preparatory School to Washington, D.C. offers the cadet a multitude of cultural and entertainment activities.

To be eligible for admission to USMAPS, a candidate must meet the general requirements for entrance to West Point the following year; he must be a citizen of the United States, of good moral character, at least 17 and not more than 22 years old on 1 July of the year he plans *to enter West Point*, and must never have been married. Additionally, a candidate must be medically qualified for admission to West Point in order to be enrolled in the Prep School.

All applicants must be in an Active Duty enlisted status in the Army prior to entering the Preparatory School. Reservists may enter on Active Duty for a period of two years in order to attend USMAPS, provided advance authority is obtained from The Adjutant General; selected civilian

candidates may, with the approval of The Adjutant General, be enlisted specifically to attend the Prep School.

Application procedures differ for USMAPS candidates depending on their status (Military or civilian) prior to entry. Active Army applicants must follow the format prescribed in AR 351-12. Army Reserve and National Guard personnel who are not on active duty must apply by letter to The Adjutant General, HQDA (DAAG-PSA-M), Forrestal Building, Washington, D.C. 20314. Civilian applicants should begin a file for admission to West Point and indicate in writing their desire to be considered for USMAPS should they not be selected for USMA. Each Spring, the USMA Admissions Office screens, for USMAPS consideration, the list of qualified candidates who, at that time, are not selected for admission to West Point. Each young man so identified will be asked about his interest in attending the Preparatory School as an alternate route to gain admission to the Academy. Of those interested, a limited number will be selected, on a competitive basis, and referred to The Adjutant General for enlistment to attend the Prep School. Further information on the USMA Preparatory School may be obtained by writing to the Commandant, USMA Preparatory School, Ft. Belvoir, VA 22060; to the Director of Admissions and Registrar, USMA, West Point, N.Y. 10996; or to The Adjutant General, HQDA (DAAG-PSA-M), Forrestal Building, Washington, D.C. 20314.

RESIGNATIONS AND SEPARATIONS

General Policy. A cadet who is separated (separation refers to the voluntary or involuntary disenrollment of a cadet) and who entered the Academy from enlisted status in the Regular or Reserve Component of any service will revert to his former status under the appropriate statutory provisions. However, completion or partial completion of a prior service obligation in no way exempts a separated cadet from acquiring a new active duty obligation through the policy outlined below.

A cadet who is separated and who entered the Academy from a commissioned status may apply for the commission he relinquished upon entry to the Academy.

A cadet who is separated from the Academy because of physical disability or because of demonstrated unsuitability or unfitness for military service will be discharged in accordance with the current Army Regulations.

When a cadet who entered from a civilian status is separated from the Academy, his Selective Service Board will be notified of his change in status.

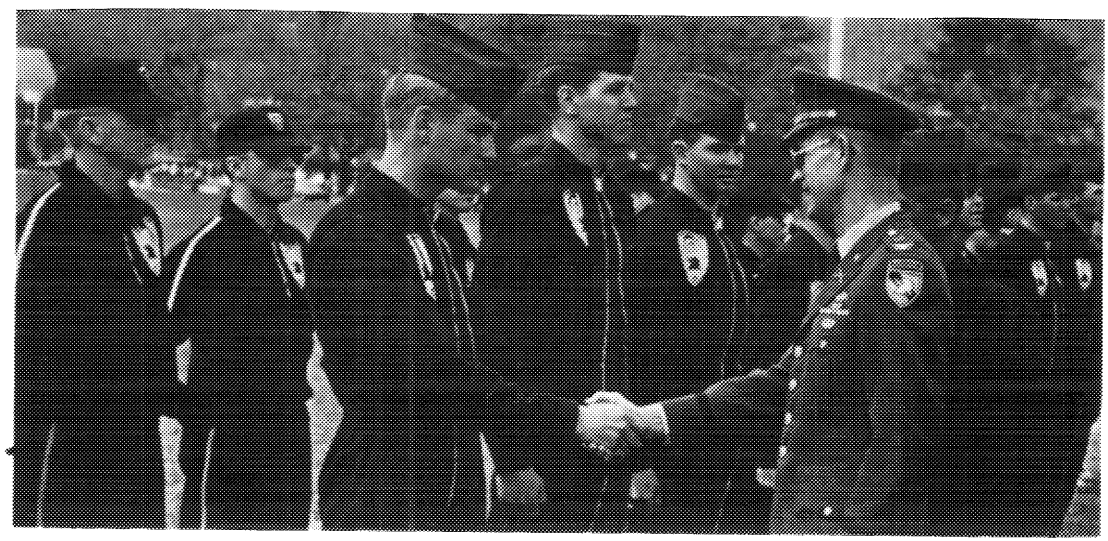
Specific Policy

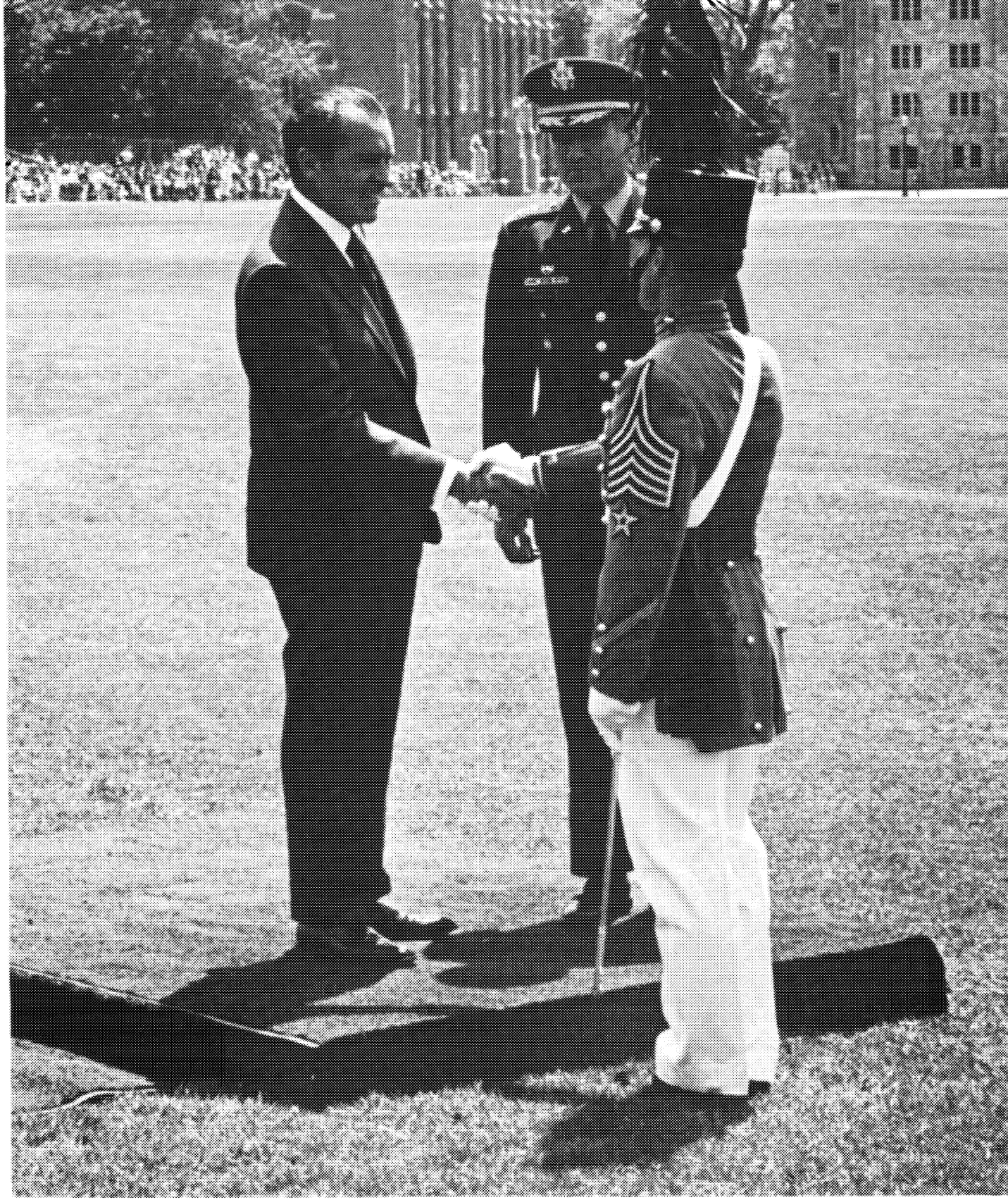
Fourth and Third Classmen (freshmen and sophomores): Any Fourth or Third Classman (or a Second Classman [junior] prior to the beginning of the Second Class academic year), except as outlined in the general policy section above, who is separated or whose resignation is accepted will be discharged from the service in accordance with current Army Regulations. The resignation will be accepted when found to be in the best interests of the service.

Second and First Classmen (juniors and seniors): Any Second Classman (with the commencement of the Second Class academic year) or First Classman who is separated prior to commissioning, except for physical disability, unfitness, or unsuitability, will normally be transferred to the Reserve component in an enlisted status and will be ordered to active duty for not less than two years nor more than four years. A cadet who is separated prior to completion of his third academic year will be recommended for two years of enlisted active duty. A cadet who completes his third academic year will be recommended for three years of enlisted active duty. A cadet who completes his fourth academic year and declines acceptance of a commission will be recommended for four years of enlisted active duty. When separation occurs as a result of deficiencies which are not considered willful, the enlisted active duty provisions may be waived.

Inter-Service Transfers of USMA Graduates

Effective with the Class of 1975, all graduates of the United States Military Academy who are physically qualified for commissioning normally will be commissioned in the United States Army. Approval by the Secretary of the Army for a graduate to be commissioned in another service will be granted only under the most unusual circumstances.





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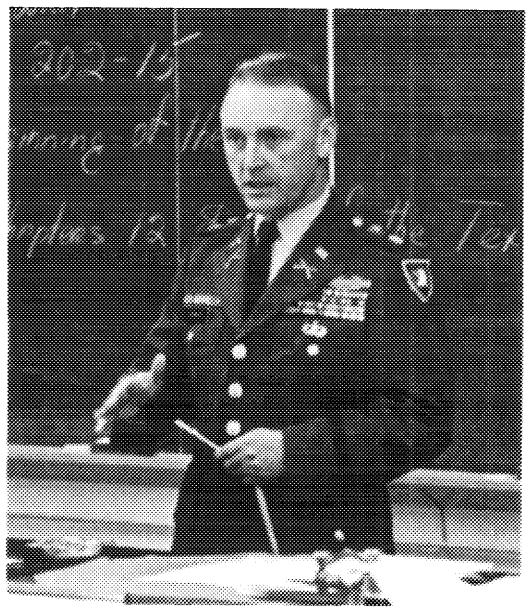


BOARD OF VISITORS

The Board of Visitors to the United States Military Academy was created not long after the founding of the institution itself. On 1 July 1815, the Secretary of War, William H. Crawford, approved "A Regulation for the Government of the Military Academy" providing for the appointment of a Board to consist of five "competent gentlemen," under the presidency of the Superintendent. The Board was instructed to attend each of the annual and semi-annual examinations at West Point and report thereon to the Secretary.

At present the Boards are appointed under the provisions of an Act of Congress approved 29 June 1948. This act specifies that a Board of Visitors shall visit the Military Academy each year and inquire into the state of morale and discipline, curriculum, instruction, physical equipment, fiscal affairs, academic methods, and other matters relating to the institution which the Board may decide to consider, and submit a written report to the President of the United States giving its views and recommendations pertaining to the United States Military Academy. The personnel of the Board, the Act provides, shall be as follows:

a. The Chairman of the Committee on Armed Services of the Senate, or his designee
b. Three other Members of the Senate designated by the Vice President or the

President pro tempore of the Senate, two of whom shall be members of the Committee on Appropriations of the Senate

c. The Chairman of the Committee on Armed Services of the House of Representatives, or his designee

d. Four other Members of the House of Representatives to be appointed by the Speaker of the House of Representatives, two of whom shall be members of the Committee on Appropriations of the House of Representatives

e. Six persons designated by the President

BOARD OF VISITORS 1972

From the United States Senate

Honorable BARRY GOLDWATER, Arizona (representing Honorable JOHN C. STENNIS, Chairman of the Committee on Armed Services)

Honorable MARK O. HATFIELD, Oregon

Honorable HUBERT H. HUMPHREY, Minnesota

Honorable DANIEL K. INOUYE, Hawaii

From the United States House of Representatives

Honorable CARLETON J. KING, New York (representing Honorable F. EDWARD HEBERT, Chairman of the Committee on Armed Services)

Honorable GLENN R. DAVIS, Wisconsin

Honorable W. R. HULL, JR., Missouri

Honorable JOHN M. MURPHY, New York

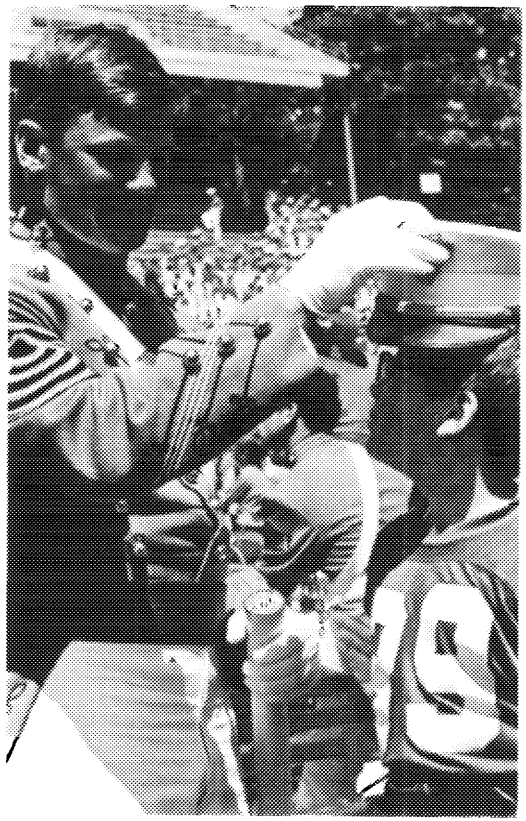
Honorable ALEXANDER PIRNIE, New York

Appointed by the President of the United States

Dr. D. WHITNEY HALLADAY, President, East Texas State University (appointed in 1971 to serve through 1973)

Mr. LEONARD D. HENRY, AVCO Corporation, New York City (appointed in 1972 to serve through 1974)

Mr. LAURENCE F. LEE, JR., Chairman of the Board, Peninsular Life Insurance Company, Jacksonville, Florida (appointed in 1972 to serve through 1974)



Major General LEIF J. SVERDRUP, USAR (Ret), Chairman of the Board, Sverdrup and Parcel and Associates, Inc., St. Louis, Missouri (appointed in 1970 to serve through 1972)

Mr. LOUIS R. VICENTI, President, Mutual Savings and Loan Association, Pasadena, California (appointed in 1970 to serve through 1972)

General A. C. WEDEMEYER, USA (Ret), Friends Advice, Boyds, Maryland (appointed in 1971 to serve through 1973)

ASSOCIATION OF GRADUATES

The Association of Graduates, USMA, is a voluntary membership organization open to all graduates of the Military Academy and to former cadets who were honorably discharged after at least one academic term at the Academy. Over 97 per cent of the 20,986 living graduates, and many former cadets who did not graduate, are members.

The Association was founded at New York City in 1869 under the personal leadership of Brig. Gen. Sylvanus Thayer, USMA 1810, and Maj. Gen. Robert Anderson, USMA 1825, hero of Fort Sumter. Annual meetings have been held at West Point during June Week since 1870. Its purpose is "To acquire and disseminate information on the history, activities, objectives, and methods of the Military Academy; to acquire and preserve historical materials relating to that institution; and to encourage and foster the study of military science there by worthy young men."

The Bureau of Internal Revenue has ruled that the Association is tax-exempt and all gifts, contributions, donations and bequests thereto are likewise exempt from taxation. The Association of Graduates is the only organization through which alumni as a body can contribute their time, effort, and money toward the enhancement of their Alma Mater. Gifts to the General Fund support operating expenses while those contributions earmarked for the Endowment Fund are deposited to the principal of that fund and remain there for investment purposes. Funds invested by the Endowment Fund work for the Military Academy and the Association in perpetuity.

Under the aegis of the Association four annual events have grown to become important traditions. At the Alumni Parade in June Week the Long Gray Line, led by the Superintendent, the President of the Association of Graduates, and the Oldest Graduate Present, marches from Cullum Memorial Hall to Thayer Monument. There, in the presence of the Corps and a multitude of visitors, homage is paid to the "Father of the Military Academy" and to the memory of those graduates who died during the preceding year. It has been said that this gathering of alumni represents, by those attending, more United States history than any other group of similar size.

Homecoming Day is celebrated annually in the Fall at one of the home football games. This occasion, which was first established in 1958, is the scheduled reunion period for the more junior classes, and it affords alumni a second annual opportunity to visit their Alma Mater and renew old acquaintances. In addition to the football game, there is a Thayer monument ceremony and a review in honor of alumni by the Corps of Cadets.

Founders Day, 16 March, is celebrated at West Point and at over 100 other locations throughout the world. These annual celebrations, supported by the Association of Graduates, traditionally include a dinner, attended by all alumni within commuting distance, and speeches by the oldest and youngest graduates present.

Each year since 1958 the Association of Graduates has presented the Sylvanus Thayer Award, a gold medal, to the United States citizen whose record of service to his country exemplifies devotion to the principles expressed in the motto of West Point — "Duty, Honor, Country." Recipients of the award have been Dr. E. O. Lawrence in 1958, John Foster Dulles in 1959, Henry Cabot Lodge in 1960, Dwight D. Eisenhower in 1961, Douglas MacArthur in 1962, John J. McCloy in 1963, Robert A. Lovett in 1964, Dr. James B. Conant in 1965, Carl Vinson in 1966, Francis Cardinal Spellman in 1967, Bob Hope in 1968, Dean Rusk in 1969, Ellsworth Bunker in 1970, Neil A. Armstrong in 1971, and William Franklin Graham in 1972.

The major programs of the Association include maintenance of biographical files on all graduates; publication of necrologies and class reports in *Assembly;* receipt and disposition of historical items; assistance in establishment and support of West Point Societies; maintenance of an up-to-date list of addresses; correspondence concerning graduates; presentation of awards to cadets; selection of the person to receive the Sylvanus Thayer Award; and organization of alumni activities at West Point.

Information is disseminated through two publications published by the West Point Alumni Foundation, Inc., a nonprofit corporation. The annual *Register of Graduates and Former Cadets* includes a summary of each graduate, where he is and what he is doing. The quarterly magazine *Assembly* under the editorial sponsorship of the Association of Graduates gives current information about the Academy and its graduates.

The Association's administrative organization consists of a President and ten Vice Presidents, elected annually; a Secretary-Treasurer; and 36 Trustees, 12 of

whom are elected annually for terms of 3 years. The Association's office is located in Cullum Memorial Hall.

Cooperating with the Association are the following autonomous West Point Societies:

Alabama
- Alabama (Birmingham)
- Fort McClellan
- Mobile
- Tennessee Valley (Huntsville)

Arizona
- Phoenix
- Southern Arizona (Tucson)

California
- Los Angeles
- Monterey Peninsula (Monterey)
- San Diego
- San Francisco Bay Area

Colorado
- Denver
- Pikes Peak Region (Colorado Springs)

Connecticut
- Connecticut (Hartford)

District of Columbia
- District of Columbia

Florida
- Canaveral
- Central Florida (Orlando)
- Florida West Coast (Tampa)
- North Florida (Jacksonville)
- South Florida (Miami)

Georgia
- Atlanta
- Savannah
- Columbus (Fort Benning)

Great Britain and Ireland

Hawaii
- Hawaii (Honolulu)

Illinois
- Central Illinois (Champaign-Urbana)
- Chicago

Indiana
- Indianapolis

Kentucky
- Louisville

Louisiana
- Mid-Gulf (New Orleans)

Maryland
- Maryland (Baltimore)

Massachusetts
- New England (Boston)

Michigan
- Michigan (Detroit)

Minnesota
- Minnesota (Minneapolis)

Missouri
- Kansas City
- St. Louis

New Jersey
- Central New Jersey (Fort Monmouth)

New Mexico
- Albuquerque

New York
- Capital District (Albany)
- Ithaca
- New York (New York City)
- Rochester
- Western New York (Buffalo)

North Carolina
- Western North Carolina (Asheville)
- Piedmont

North Dakota
- North Dakota (Bismarck)

Ohio
- Central Ohio (Columbus)
- Cincinnati
- Cleveland
- Northwestern Ohio (Van Wert)
- Dayton

Oklahoma
- Central Oklahoma (Oklahoma City)
- Eastern Oklahoma (Tulsa)

Oregon
- Portland

Pennsylvania
- Central Pennsylvania (Harrisburg)
- Philadelphia
- Western Pennsylvania (Pittsburgh)

Philippine Islands
- Philippines (Manila)

South Carolina
- Charleston
- Columbia

Tennessee
- East Tennessee
- Middle Tennessee
- West Tennessee

Texas
- Central Texas (Austin)
- El Paso Area
- Houston
- Midland
- North Texas (Dallas)
- South Texas (Fort Sam Houston)

Venezuela
- Venezuela (Caracas)

Virginia
- Hampton Roads (Hampton)

Washington
- Puget Sound (Seattle)

Wisconsin
- Wisconsin (Milwaukee)

THE WEST POINT ALUMNI FOUNDATION

The West Point Alumni Foundation, Inc., is a nonprofit, tax-exempt educational institution-support organization whose objectives are designed to contribute to the welfare and enrichment of the United States Military Academy and the Corps of Cadets. The Foundation was chartered in the State of Maryland in 1945 and maintains an office at West Point. Its operations are directed by a Board of Managers composed of distinguished alumni.

The Foundation is presently engaged in two principal areas of endeavor in furtherance of its purposes. One of these is the financing and distribution of alumni publications in concert with the Association of Graduates, USMA. The other is the maintenance and employment of the West Point Fund (formerly West Point Superintendent's Fund).

The alumni publications are *Assembly* and the *Register of Graduates and Former Cadets USMA*. *Assembly* is a quarterly magazine containing articles of current interest on developments and events at the Academy, class notes, and memorial articles about deceased graduates. It is edited by the Association of Graduates and contains no advertising. The *Register of Graduates* is an annual publication which lists graduates of the Military Academy by class and order of graduation. It provides a brief resume of their careers as well as pertinent data on current addresses or assignments and other matters of interest relating to individual alumni and their association with the Academy. This book is edited by the Foundation and contains a limited amount of advertising. The costs of both publications are met mainly by subscriptions and advertising revenues collected by the Foundation, and by private donations for such purposes to the Foundation.

The West Point Fund was established by the West Point Alumni Foundation, Inc. in 1961. Its objective is to obtain from private donations, gifts and bequests, the sums needed to undertake projects benefiting the Corps of Cadets and the Military Academy for which appropriated fund support is not available. Since its inception the Fund has made possible a number of additions to programs, equipment and facilities, and other improvements at the Academy, ranging from minor items of equipment and cadet program support to major facilities and activities.

Contributions to the Fund, whether cash or securities, go directly to the West Point Alumni Foundation, Inc., a non-profit organization registered with the Internal Revenue Service, and receive the favorable tax deductibility provided for in Section 170 of the Internal Revenue Code. The Fund does not hold or invest in securities; hence, all such gifts are usually, as a matter of policy, converted to cash assets immediately upon receipt.

Conditional gifts or bequests are accepted only if their provisions are acceptable to the Military Academy. Unrestricted gifts are preferred. Their use is governed by action of a Policy Committee on recommendations of the Superintendent. This Policy Committee is composed of: the President, Association of Graduates; the President, West Point Alumni Foundation, Inc.; the Chairman, West Point Fund Committee; an Adviser to the Fund Committee; a representative of the Chief of Staff,

U.S. Army; the President, Post Planning Board; and the Secretary-Treasurer, West Point Alumni Foundation.

Additional information on the Foundation and its activities may be obtained by writing the Secretary-Treasurer, West Point Alumni Foundation, Inc., West Point, N.Y. 10996.

MEDICAL STANDARDS

Medical Examination and Disqualifications

The Qualifying Medical Examination is the means whereby an individual's medical qualification for appointment to the service academies is determined. Medical examinations are conducted at designated examining centers (Army, Navy, Air Force) located throughout the United States and at designated oversea bases. One general standardized examination is used by all service academies. Examinations to be considered as final qualifying examinations must be taken on or after 1 June of the year preceding the year of admission. Examinations taken prior to 1 June of the year preceding the year of admission are acceptable only as preliminary examinations. Therefore, individuals who are not selected for admission in a given year must retake the Qualifying Medical Examination should they become candidates in succeeding years.

Review Procedures

The examining facility will send the Qualifying Medical Examination results to the Service Academies Central Medical Review Board (SACMRB) which will evaluate the results and furnish the Military Academy with a determination of the candidate's medical status. The Military Academy will then notify the candidate and his nominating authority.

Medical qualification decisions made by the reviewing authority is final. In this respect, where the disqualifying defect is subject to medical or dental correction, the candidate may be temporarily rejected subject to later certification by a physician or dentist that the defect has been corrected with complete restoration of function. Such certification must be in the hands of the reviewing authority as soon as possible, but in any case, no later than 15 March.

Applicant Actions

It is strongly recommended that applicants arrange for another person to drive them to the testing center. Certain tests may preclude driving for several hours after the examination is completed and results in unnecessary delays. *Applicants who wear contact lenses must remove them a minimum of 72 hours prior to the examination.*

Candidates are encouraged to undergo a thorough medical and dental examination by their private physician and dentist before pursuing nomination and before taking a qualifying medical examination. This will serve to identify obviously disqualified applicants or those who may have remediable defects which must be corrected, at the candidate's expense, prior to taking the Qualifying Medical Examination.

It must be clearly understood that a medical and dental examination by the applicant's civilian physician and dentist is a preliminary and exploratory one *only*

and cannot be considered as a qualifying examination. Only examinations given at Army, Navy or Air Force medical facilities are acceptable as a qualifying examination.

Special Medical Examination Considerations and Disqualifications

Disqualifying medical conditions as set forth below are for use as a guide by the physician and dentist in determining medical disqualification or remediable medical and dental conditions. Reference should be made to the regulations of the applicable service for specific details as to standards of medical fitness as pertain to the Army, Navy, or Air Force.

Medical History

The medical history will be compiled with particular care with elaboration where indicated. Full and complete documentation of all illnesses, injuries and operations which the applicant may have incurred is absolutely necessary since failure to do so may result in disappointment when medical disqualification is determined later. A history of familial diseases will be thoroughly investigated. Medical care which has significantly affected the applicant's medical status must be documented and supported by statements from the attending physician or from hospital records concerning the medical care.

Height and Weight Standards

The weight standards as noted are necessarily arbitrary and as a general rule will not be waivered. However, when a generally large bony structure and large well-distributed and proportioned muscle masses with little evidence of thick layers of subcutaneous fat account for the apparent excessive weight, exception to the standards may be granted. Underweight conditions will not be waivered. Gross obesity is a disqualifying factor until such time as excess weight is lost. In any event, each case will be judged on its own merits. Heights should be measured to the nearest

half inch. U.S. Military Academy standards of weight according to height are as follows:

Height	Weight	
64	105	183
65	106	187
66	107	191
67	111	196
68	115	202
69	119	208
70	123	214
71	127	219
72	131	225
73	135	231
74	139	237
75	143	243
76	147	248
77	151	254
78	153	260
79	159	266
80	166	273

A range in height from 66″ to 80″ inclusive is required. Candidates who are below the minimum height of 66″ will automatically be considered for an administrative waiver by West Point, during the processing of their cases provided they have exceptional educational qualification, outstanding military record, or demonstrated outstanding abilities.

Eyes and Vision Disqualifications

VISION

Distant visual acuity which does not correct to at least 20/20 in each eye with *spectacle lenses.*

MUSCLE BALANCE

1. *Esophoria* over 15 prism diopters.
2. *Exophoria* over 10 prism diopters.
3. *Hyperphoria* over 2 prism diopters.
4. Strabismus (Tropia) disqualifying for all candidates.

COLOR VISION

Must be able to distinguish vivid red and vivid green.

CYCLOPLEGIC REFRACTION

All candidates.

REFRACTIVE ERROR

1. *MYOPIA* over 5.50 diopters in any meridian.
2. *HYPEROPIA* over 5.50 diopters in any meridian.
3. *ASTIGMATISM* all types over 3 diopters.
4. *ANISOMETROPIA* over 3.50 diopters.

CONTACT LENSES

Removed 72 hours prior to examination.

EARS AND HEARING DISQUALIFICATIONS

The auditory acuity of all candidates will be determined by the use of the audiometer. Maximum allowable loss in decibels and the frequencies noted is as follows:

Hearing Loss

(International Standards Organization Calibration ISO)

Frequency	500	1000	2000	3000	4000	6000	8000
Maximum Loss in Decibels							
Right Ear	30	25	25	*	45	*	*
Left Ear	30	25	25	*	45	*	*

** Not standardized or no requirement.*

Both ears must be free from any disfiguring or incapacitating abnormalities. Other causes for rejection are: Existing perforations of the tympanic membrane regardless of etiology. Exostosis or other form of canal blockage resulting in examiner's inability to effectively view the tympanic membrane, may be cause for rejection.

The following table should be used to convert the International Standards Organization (ISO) Calibration given above to the American Standard (ASA) Calibration still used on many audiometers. To convert ISO to ASA, subtract the decibels loss indicated for the frequencies listed below:

Frequency	*Subtract for ASA*
500	15 decibels
1000	10 decibels
2000	10 decibels
3000	10 decibels
4000	5 decibels
6000	10 decibels
8000	10 decibels

Nasal Disqualifications

Any congenital or acquired lesion which interferes with the functions of the nasopharynx or eustachian tubes. Septal deviation, hypertrophic rhinitis, nasal polyps or other conditions which result in 50% or more obstruction to either airway or obstruction to drainage of any sinus. Allergic rhinitis not controllable by antihistamines or by desensitization, or both is disqualifying for the U.S. Military Academy. History of acute or chronic sinusitis will be evaluated thoroughly and completely.

Lung and Chest Disqualifications

Tuberculosis active at any time during the past two years in any form or location. A positive skin test, without other evidence of active disease is not disqualifying. Individuals taking prophylactic chemotherapy because of recent skin test conversion are not disqualified. Pneumothorax or history thereof within 1 year of date of examination if due to simple trauma or surgery; within 3 years of date of examination if of spontaneous origin.

Surgical correction is acceptable if no significant residual disease or deformity remains and pulmonary function tests are within normal limits.

Allergic Disqualifications

Asthma or a history of asthma, except a history of childhood asthma with a trustworthy history of freedom from symptoms since the 12th birthday, is a cause for rejection. A history of allergic rhinitis past the 12th year, including those cases in which desensitization therapy has been initiated, will be evaluated thoroughly. In many cases a specialty consultation in allergy will be required. Also see Nasal Disqualifications.

Skin Disqualifications

Psoriasis, even if moderate in degree. Acne, moderately severe or resultant scarring severe enough to interfere with wearing of personal military equipment or disfiguring scarring. Chronic skin disease such as severe eczema or unsightly congenital markings. Bromidrosis which is more than mild. Pilonidal cyst if evidenced by presence of mass or discharging sinus. Extensive deep or adherent scars that interfere with movement or wearing of military equipment.

Heart and Vascular System Disqualifications

An electrocardiogram is required of all applicants. Electrocardiographic abnormalities will be evaluated to determine if an organic basis exists. A history of rheumatic fever will require a thorough investigation including detailed history, fluoroscopic examination of the heart and an X-ray film in addition to a careful general medical examination. All murmurs will be evaluated thoroughly and indicated as functional or organic in origin. Any evidence of organic heart disease is unequivocally disqualifying. All valvular disease of the heart, including that which has been improved by surgery. Blood pressure greater than 139 millimeters or diastolic pressure greater than 89 will be cause for extensive evaluation to determine if persistent hypertension exists. Hypertension evidenced by preponderant readings of 140-mm or more systolic or preponderant diastolic pressure of over 90-mm. Heart rate greater than 100 on repeated examinations will be cause for further evaluation. Varicosities of any extremities if severe or symptomatic unless mild in degree or correctable by treatment.

Genitourinary System Disqualifications

Persistent albuminuria of any type to include so-called orthostatic albuminuria or the persistence of casts in the urine, even though the etiology cannot be determined, will be cause for rejection. Phimosis, epispadias, or pronounced hypospadius severe enough to interfere with micturition. Amputation of the penis, infantile genitalia, atrophy, absence, deformity or maldevelopment of *both* testicles, or undescended testicle of any degree unless surgically corrected. Chronic orchitis or epididymitis. Chronic kidney diseases. Repeated attacks of renal calculi. Absence of one kidney, regardless of cause.

Serologic Test

A serologic test for syphilis is required for all applicants.

Abdomen Disqualifications

Weakness of abdominal wall sufficient to interfere with function. Hernias of any

type unless surgically corrected. History of operation for hernia within past 60 days is temporarily disqualifying. Chronic diseases of abdominal viscera. History of gastric or duodenal ulcer. Acute or chronic gallbladder disease. History of splenectomy for any reason other than trauma.

Orthopedic Disqualifications

Ununited fractures, old joint fractures with evidence of arthritis. Pes planus more than mild, symptomatic, or with marked bulging of the inner border due to rotation or eversion of the astragalus and any callosities. Pes cavus with clawing of the toes and calluses beneath the metatarsal heads can be cause for rejection. Hammertoes of such degree as to interfere with function or wearing of suitable footwear. Other conditions of the feet which would interfere with successful compliance with military routine. History of derangement of knee joint not corrected by surgery if symptomatic within one year preceding examination. Six months must elapse after knee surgery before final evaluation. Post operative instability, stiffness, traumatic arthritis, muscle atrophy or weakness will be thoroughly evaluated, and may be cause for rejection.

Spine and Musculoskeletal Disqualifications

Defects and diseases of the spine, scapulae, ribs, or sacroiliac joints which interfere with the daily participation in a rigorous physical training or athletic program, with the wearing of military equipment, or which detract from a smart military bearing or appearance. Spondylolysis or spondylolisthesis that is symptomatic or likely to interfere with performance. Gout. Deficient muscular development. Tuberculosis of spine, active or healed. History of herniated nucleus pulposus or surgical correction of such a condition is cause for disqualification.

Extremities Disqualifications

Total loss of either thumb. Loss of other digits sufficient to interfere with function. Absence of one phalanx of any finger in association with the absence of the little finger of the same hand. Loss of either great toe.

Neurological Disqualifications

History of head injury resulting in unconsciousness will be thoroughly evaluated. Lengthy periods of unconsciousness will require a complete neurological consultation to include electroencephalogram. Degenerative disorders, convulsive disorders, even though controlled by medication. Residuals of infection (polio, meningitis, etc.). Miscellaneous disorders such as tics, spasms and spina bifida, is associated with neurological manifestations. All periods of amnesia will be evaluated thoroughly and completely regardless of length. History of unexplained unconsciousness. Multiple episodes of syncope (fainting). Documented history of migraine headaches or chronic headaches of such a nature as to interfere with daily functions or requiring medical treatment. A history of multiple episodes of air sickness (air, sea, swing, train, or carnival ride), will be thoroughly evaluated and may be cause for rejection.

Psychiatric Disqualifications

History of emotional instability, psychosis, anxiety reaction or dissociative reaction. Pathologic personality types; other obsessive compulsive reactions or neurotic

depressive reaction. Addiction to alcohol or drugs. Anti-social behavior. Sexual deviation. Immaturity reaction if marked; situational maladjustment. Multiple episodes of somnambulism after 10 years of age. Multiple episodes of enuresis (bedwetting) after 10 years of age unless proven to have an organic basis. Stammering or stuttering past the age of 10 years. History of attempted suicide. Other disorders of emotion, behavior, thought, intelligence, or mood, difficult to define, will be thoroughly evaluated and may be cause for rejection.

Endocrine and Metabolic Disqualifications

Diabetes mellitus is disqualifying for the U.S. Military Academy. Persistent glycosuria including renal glycosuria is disqualifying. Exophthalmic or adenomatous goiter, from any cause associated with toxic symptoms. History of thyroidectomy. History of partial thyroidectomy will be cause for thorough evaluation and may be disqualifying. Other endocrine or metabolic disorders which preclude satisfactory performance of duty or which would require long term treatment.

Dental Disqualifications

1. Diseases and abnormalities of the mouth:
   a. Diseases such as cysts, tumors, osteomyelitis and other acute or chronic conditions which are not easily remedied and which will incapacitate the individual.
   b. Loss of oral tissues sufficient to prevent replacement of missing teeth with a satisfactory prosthetic appliance.
   c. Perforation(s) of the hard palate.
   d. Harelip, unless satisfactorily repaired by surgery, and unsightly mutilations at the lip.
   e. Fractures:
      (1) Malunion of a fracture that interferes significantly with function.
      (2) Ununited fractures.
      (3) Any fracture in which an insert such as a plate, pin or screw was left in place for fixation and may be subject to easy trauma.
   f. Deformities or conditions of the mouth, to include insufficient functionally opposed natural or artificial teeth or malocclusion, which interfere with mastication and swallowing of ordinary food, speech or breathing.
   g. A skeletal relationship between the mandible and maxilla which will preclude future satisfactory prosthetic replacement, if necessary.
2. Teeth:
   a. Numerous carious teeth which are unfilled or improperly filled or restored may be cause for disqualification.
   b. Grossly disfiguring spacing of anterior teeth.

THE PHYSICAL APTITUDE EXAMINATION (PAE)

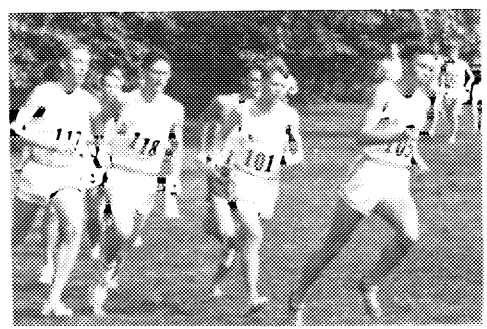
A combination of the following items, which requires the candidate to use his physical ability, constitutes the Physical Aptitude Examination of the Military Academy:

1. Pullups. From the arm hang position on a horizontal bar, palms away from the face, elevate the body until the chin is above the bar.
2. Hurdle Run. Run through a maze of hurdles on a gymnasium floor for time.
3. Standing Broad Jump. One jump for distance.
4. Shuttle Run. Run back and forth between two lines, 25 yards apart, to cover a distance of 300 yards.

A substitute for the PAE is the Motor Performance Test, a five item test which includes a basketball throw and a block shuttle run.

Below are the West Point Physical Aptitude Examination results for a recent testing cycle.

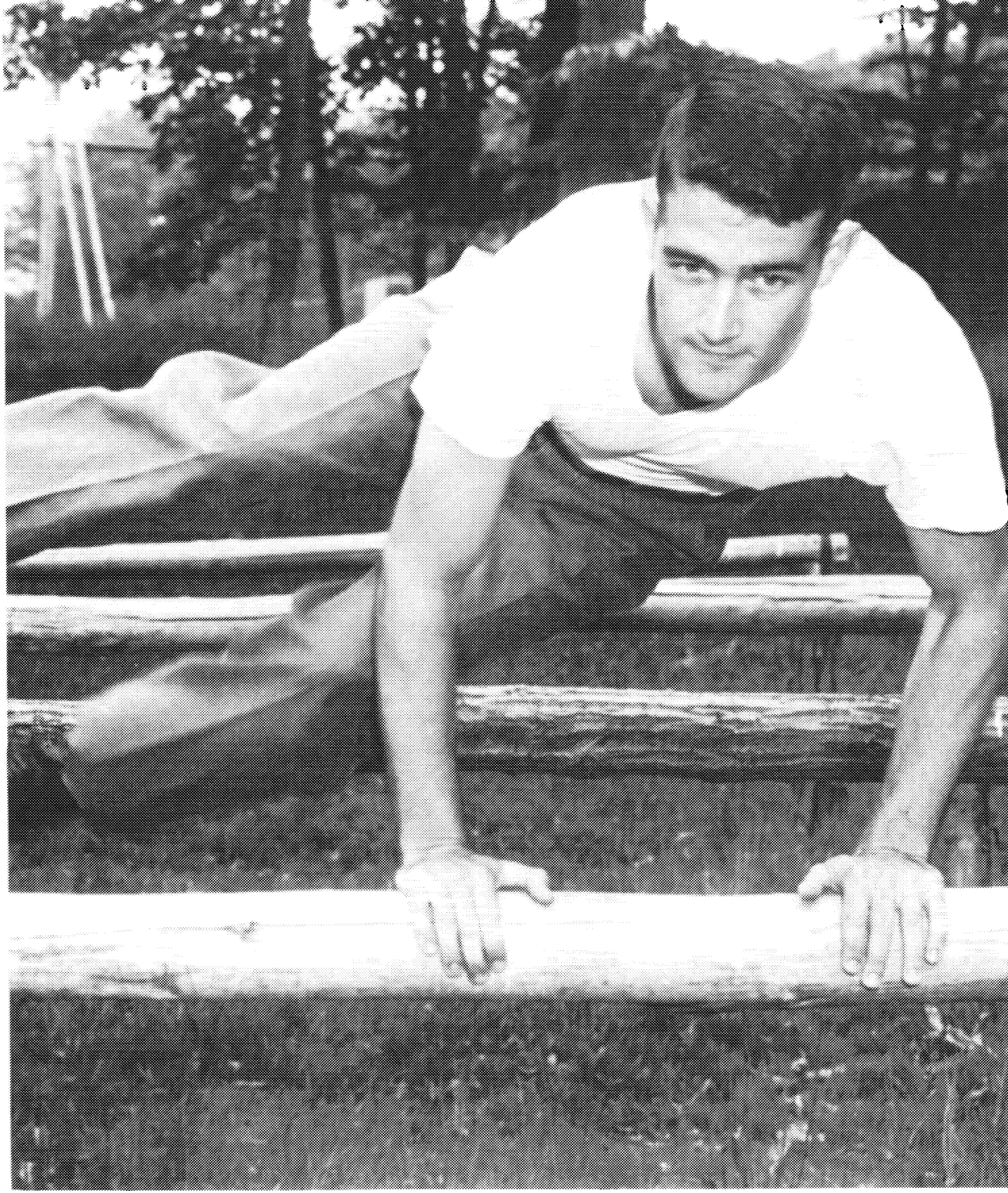
The final Physical Aptitude Examination score is a total accumulated score for all items in a given examination series adjusted to a 200-800 scale. A low or high score on any one test does not determine success or failure on the entire examination.



WEST POINT PHYSICAL APTITUDE EXAMINATION
Total Candidate Population for Entrance of a Recent Class

	PULLUPS	BASKETBALL THROW	STANDING BROAD JUMP	HURDLE RUN	300 YARD SHUTTLE	PERCENTILE
	18	90′	8′8″	33 sec	55 sec	100%
	15					
TOP QUINTILE	13	80′		34 sec		
	11	75′	8′0″	35 sec	57 sec	80%
	10	70′				
	9		7′8″			
	8	67′	7′6″	36 sec	60 sec	60%
		65′			61 sec	
	7	62′	7′4″	37 sec		
MIDDLE QUINTILE	6		7′2″		62 sec	40%
		60′			63 sec	
	5		7′0″	38 sec		
	4	55′			65 sec	20%
	3		6′8″	39 sec		
		50′	6′4″	40 sec	67 sec	
BOTTOM QUINTILE	1	40′	5′8″	42 sec	70 sec	

The basketball throw is a part of the Motor Performance Test, an authorized substitute for the West Point Physical Aptitude Examination.



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Department of Physics

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Instructional Technology Center

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Department of History

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Office of the Dean

Barron, Max R., MAJ
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Psychology and Leadership

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Department of Mathematics

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Boice, William M., MAJ
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Department of Foreign Languages

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Department of English

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Briggs, Lloyd C., CPT
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Department of Mathematics

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Department of Foreign Languages

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Electrical Engineering

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Department of Electrical Engineering

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Organist, USMA Chapel

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anl Graphic Sciences

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and Graphic Sciences

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and Head of Department of Tactics

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and Graphic Sciences

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Security Division

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Office of Military Instruction

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Department of Earth, Space
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Science Research Laboratory

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Special Services

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Department of Earth, Space and Graphic Sciences

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Department of Earth, Space and Graphic Sciences

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Office of Military Psychology and Leadership

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Department of Foreign Languages

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Department of Earth, Space and Graphic Sciences

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Department of History

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Football Coach, Office of Athletics

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Department of Tactics

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Department of Tactics

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Football Coach, Office of Athletics

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Department of Social Sciences

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Department of Tactics

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Office of Military
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Psychology and Leadership

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Office of the Dean

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Department of English

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Military Hygiene

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Department of Social Sciences

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Department of Social Sciences

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Electrical Engineering

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Football Coach, Office of Athletics

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Psychology and Leadership

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Catholic Chaplain

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Department of Earth, Space
and Graphic Sciences

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Department of Earth, Space
and Graphic Sciences

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Department of English

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Office of Military Instruction

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Medsger, Gerald W., COL
Director of Institutional Research

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Electrical Engineering

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Office of the Treasurer, USMA

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Department of History

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Department of
Electrical Engineering

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Department of Earth, Space
and Graphic Sciences

Middleton, Richard L., 2LT
Instructor, ISD, Office of the Dean

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Department of Mechanics

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Department of Mechanics

Miller, David L., MAJ
Department of English

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Office of Military
Psychology and Leadership

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Department of Engineering

Mischak, Robert M., MR
Football Coach, Office of Athletics

Mitchell, Thomas, F., CPT
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Department of Mechanics

Moentmann, Dwain T., MAJ
Office of Physical Education

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Department of Earth, Space
and Graphic Sciences

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Museum

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Department of Social Sciences

Mooradian, Moorad, MAJ
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Department of Earth, Space and Graphic Sciences

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Department of Physics

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Department of Physics

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Department of Earth, Space and Graphic Sciences

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Department of Chemistry

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Office of Military Psychology and Leadership

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Office of Physical Education

Natvig, Cliff M., MAJ
Office of Physical Education

Nau, John F., MAJ
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Navarra, James C., CPT
Department of Mathematics

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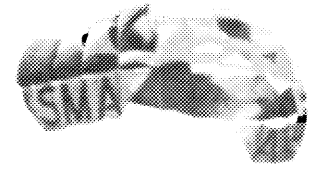

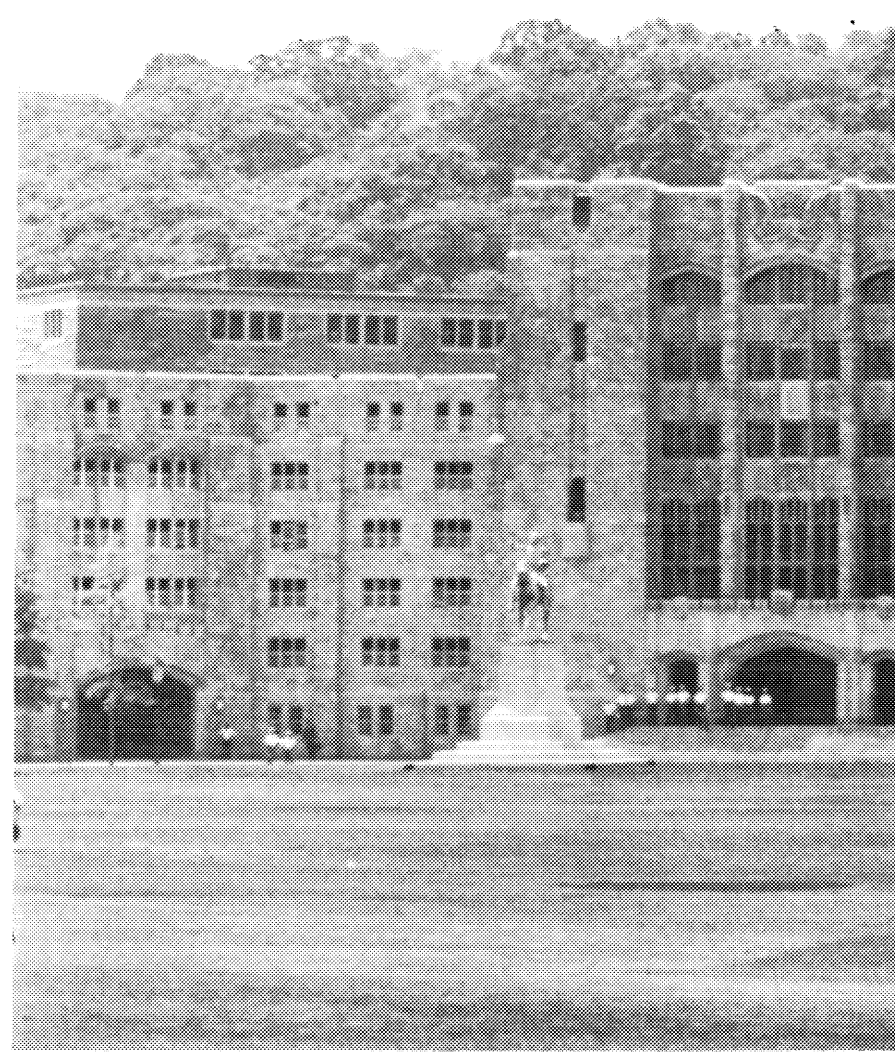

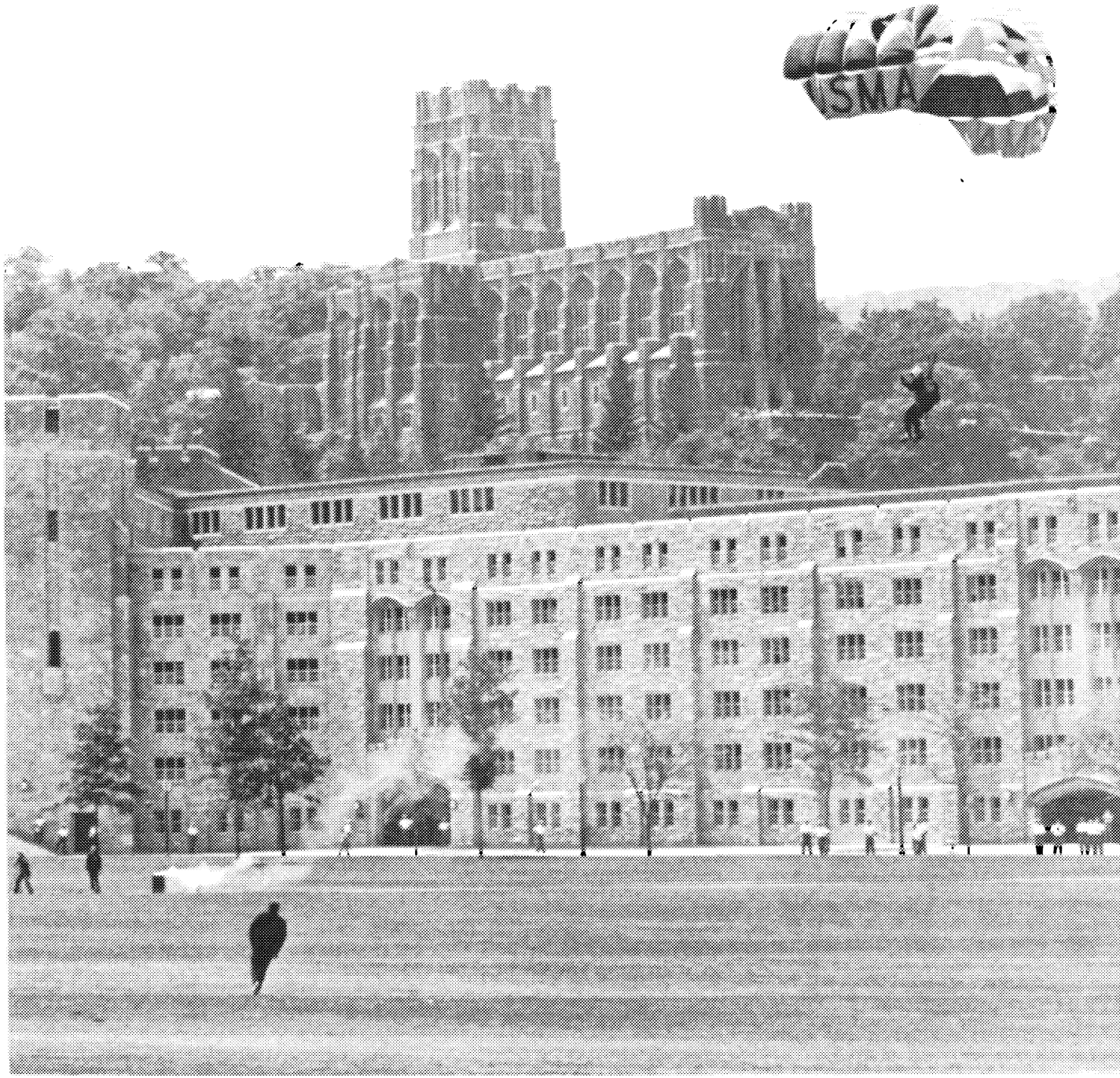

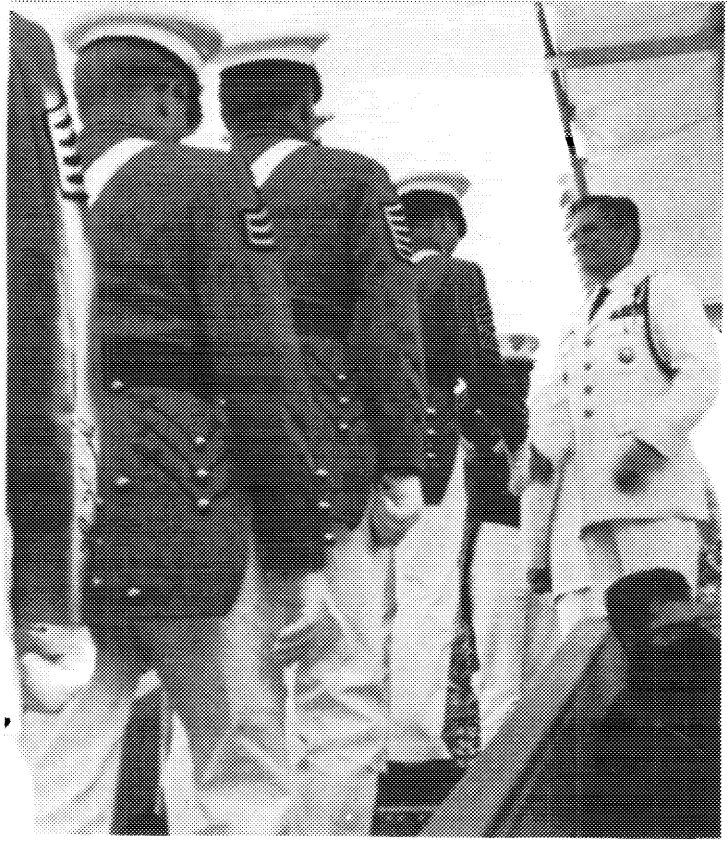

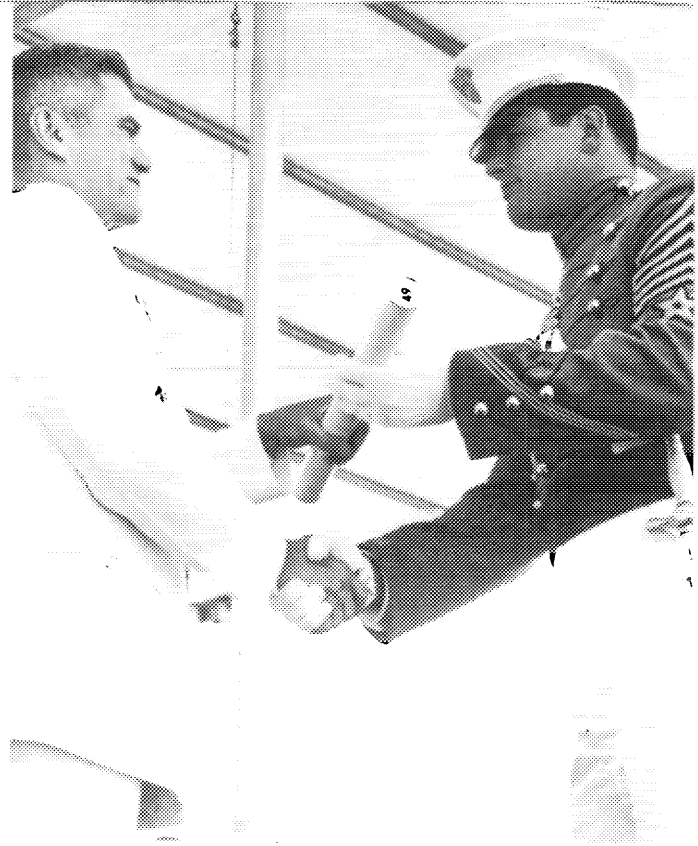

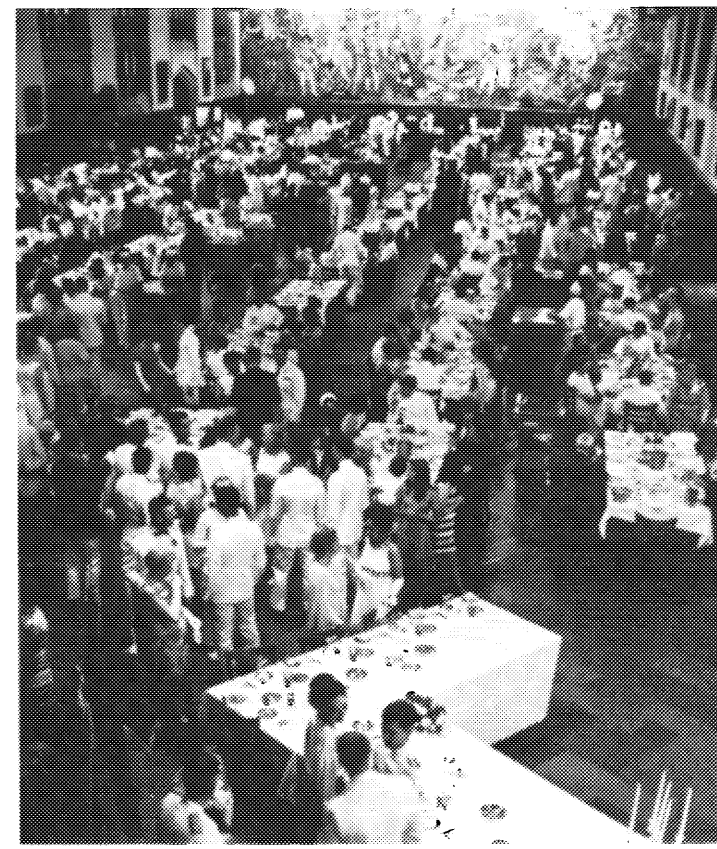

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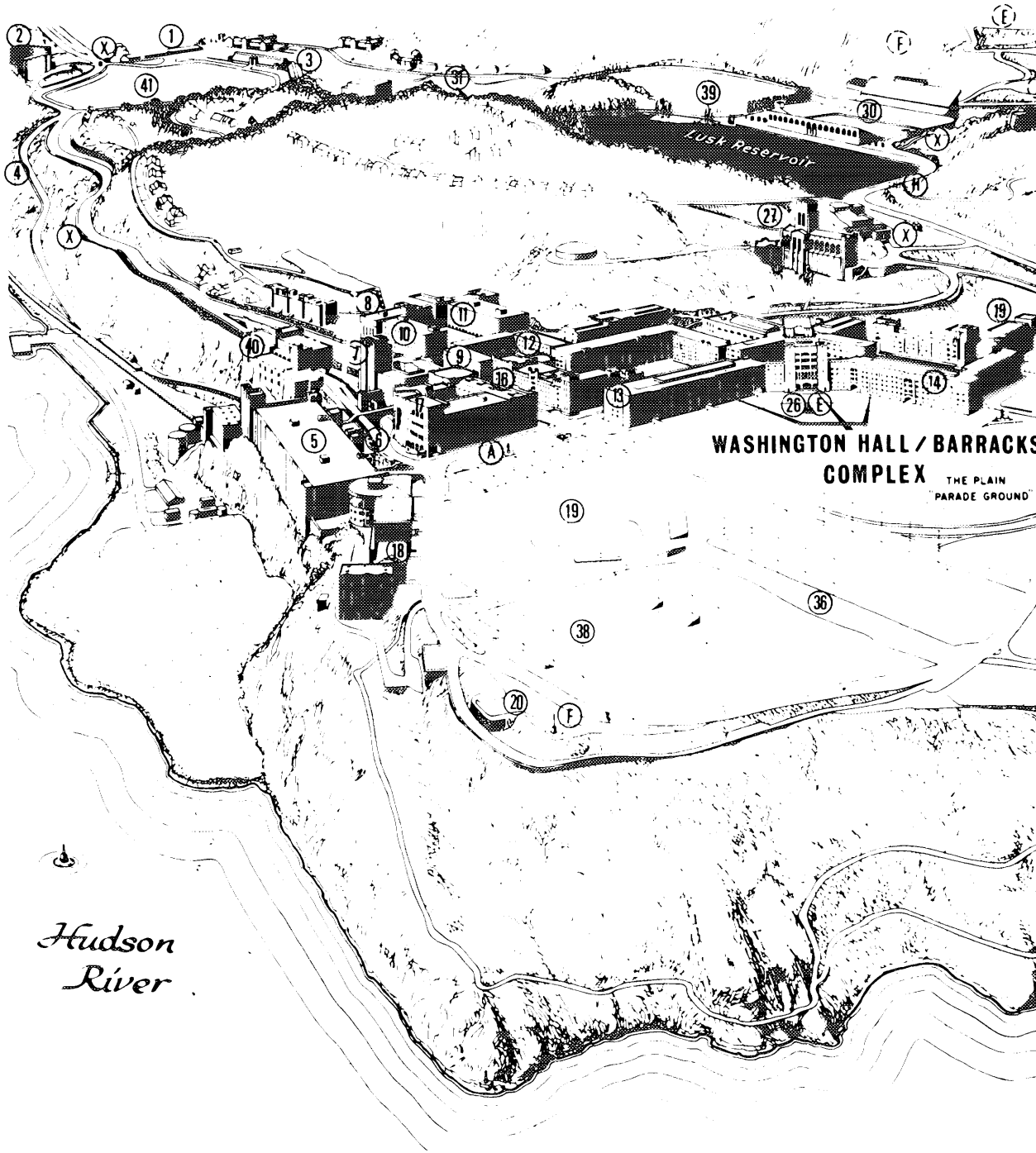

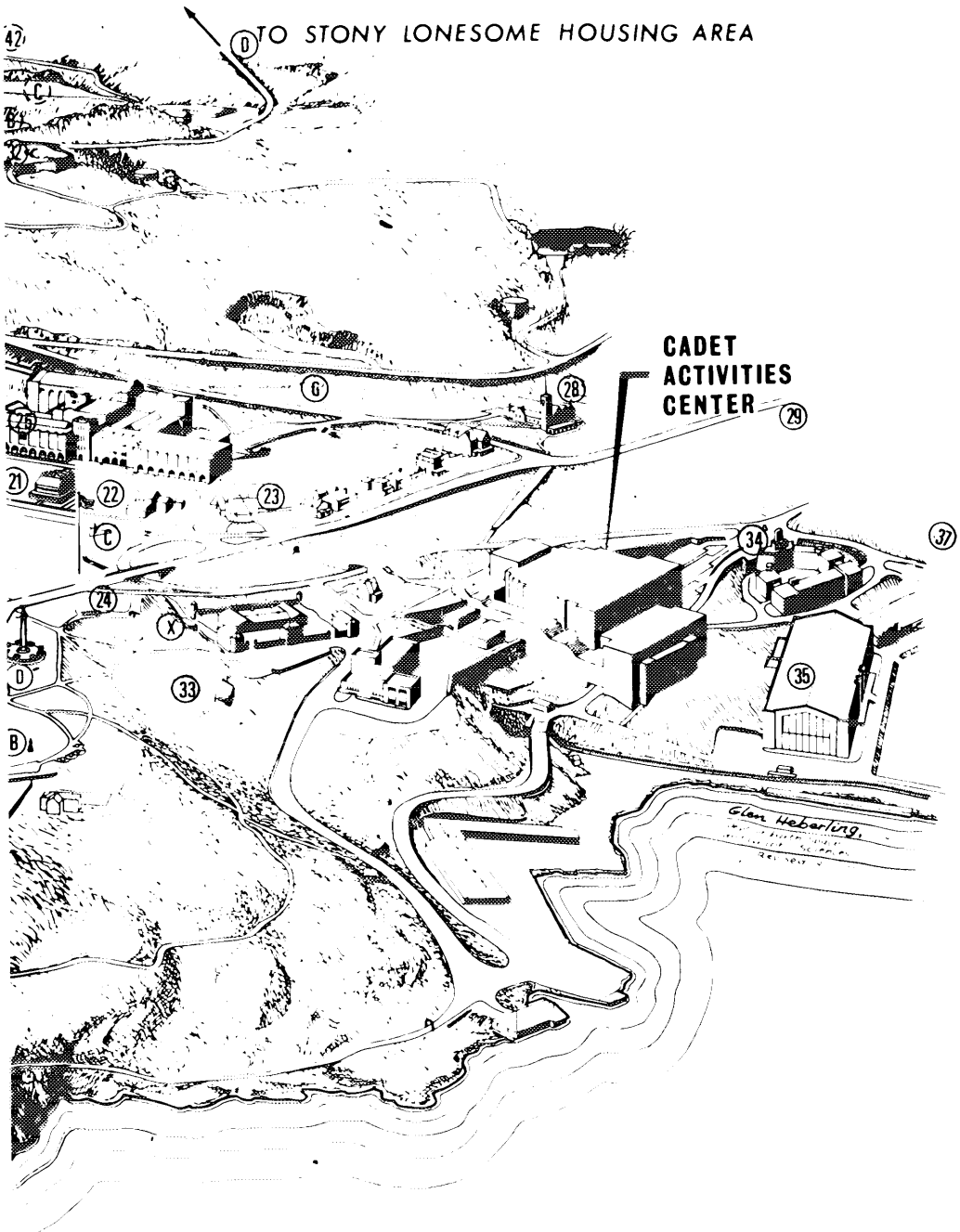

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2. Hotel Thayer
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6. Museum
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8. U.S. Army Hospital
9. Grant Hall

9-15. Cadet Barracks

16. Bartlett Hall
17. Library
18. Cullum Hall
19. Doubleday Field
20. Fort Clinton
21. Superintendent's Quarters
22. Commandant's Quarters
24. Trophy Point
25. Gymnasium
26. Washington Hall
27. Cadet Chapel
28. Catholic Chapel
29. Old Cadet Chapel
30. Michie Stadium
31. Smith Rink
32. Fort Putnam
33. Amphitheatre
34. Main Snack Bar
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42. Stadium Parking, Lots A, B, C, D, E, F

A. Patton Monument
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Cadet Prayer

O God, our Father, Thou Searchers of Men's hearts, help us to draw near to Thee in sincerity and truth. May our religion be filled with gladness and may our worship of Thee be natural.

Strengthen and increase our admiration for honest dealing and clean thinking, and suffer not our hatred of hypocrisy and pretence ever to diminish. Encourage us in our endeaver to live above the common level of life. Make us to choose the harder right instead of the easier wrong, and never to be content with a half truth when the whole can be won. Endow us with courage that is born of loyalty to all that is noble and worthy, that scorns to compromise with vice and injustice and knows no fear when truth and right are in jeopardy. Guard us against flippancy and irreverence in the sacred things of life. Grant us new ties of friendship and new opportunities of service. Kindle our hearts in fellowship with those of a cheerful countenance, and soften our hearts with sympathy for those who sorrow and suffer. Help us to maintain the honor of the Corps untarnished and unsullied and to show forth in our lives the ideals of West Point in doing our duty to Thee and to our Country. All of which we ask in the name of the Great Friend and Master of men.—Amen.

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