



UNITED STATES MILITARY ACADEMY

West Point
New York

1970/1971
Catalogue

**DUTY
HONOR
COUNTRY**

Calendar

1970

- 1 JULY, WEDNESDAY — Class of 1974 Enters
- 4 JULY, SATURDAY — Independence Day, Holiday
- 30 AUGUST, SUNDAY — Reorganization Week Begins
- 5 SEPTEMBER, SATURDAY — Reorganization Week Ends
- 7 SEPTEMBER, MONDAY — Labor Day (Duties suspended)
- 8 SEPTEMBER, TUESDAY — First Term begins
- 12 SEPTEMBER, SATURDAY — Ring Banquet and Hop
- 24 OCTOBER, SATURDAY — Homecoming (Classes Suspended)
- 11 NOVEMBER, WEDNESDAY — Veteran's Day, Holiday
- 26 NOVEMBER, THURSDAY — Thanksgiving Day, Holiday
- 28 NOVEMBER, SATURDAY — Army-Navy Football Game
- 19 DECEMBER, SATURDAY — Christmas Leave Begins (Noon)

1971

- 3 JANUARY, SUNDAY — Christmas Leave Ends (5:30 P.M.)
- 15 JANUARY, FRIDAY — Term-End Examinations Begin
- 16 JANUARY, SATURDAY — Graduate Record Exam for First Class
- 23 JANUARY, SATURDAY — First Term Ends (Noon)
- 25 JANUARY, MONDAY — Second Term Begins
- 15 FEBRUARY, MONDAY — Washington's Birthday, Holiday
- 7 APRIL, WEDNESDAY — Spring Leave Begins (3:15 P.M.)
Piebe Parent Weekend Begins
- 12 APRIL, MONDAY — Spring Leave Ends (6:00 P.M.)
Piebe Parent Weekend Ends
- 15 MAY, SATURDAY — Armed Forces Day
- 22 MAY, SATURDAY — Term-End Examinations Begin
- 29 MAY, SATURDAY — 2d Term Ends for 1st Class (Noon)
- 31 MAY, MONDAY — Memorial Day, Holiday
- 2 JUNE, WEDNESDAY — June Week Begins
- 3 JUNE, THURSDAY — 2d Term Ends for Under classes
- 9 JUNE, WEDNESDAY — Graduation Day, Class of 1971
- 1 JULY, THURSDAY — Class of 1975 Enters

UNITED
STATES
MILITARY
ACADEMY

Catalogue
1970/1971

ONE HUNDRED SIXTY-NINTH YEAR



Gentlemen:

For most of you, the time is near when you must make that important decision upon which will be structured the many years of your future. That decision is, of course, your choice of a professional education and career. As you think about the institutions and careers available, I ask you to consider seriously the opportunities offered by the United States Military Academy at West Point. The Academy today is modern in concept, staff, facilities, and training; yet, no other institution in this country can amass the same sentiment, tradition, and challenges.

In concept, West Point is far advanced from the Academy of even 10 years ago; there is a trend today toward individualization and meeting the needs and varying interests of cadets; the core curriculum is augmented by over 130 diverse electives. West Point has some of the finest and most advanced educational and physical development facilities in the world. Although the primary emphasis at West Point is on a strong general education program, training is also stressed; training develops, in the man, leadership qualities, as well as professionalism, character, physical prowess, and a unique regard for duty, honor, and country. Tradition is still highly esteemed and is everywhere apparent — in the unchanging ideals of the worth and potential of young men, in the American and military history which abounds in these Hudson highlands, in the knowledge of the accomplishments of Academy graduates.

A West Point education ultimately prepares the young man for a career in the service of his country, and offers him the challenges, excitement, diversity, idealism, and rare and gratifying sense of accomplishment that are difficult to find in other careers.

There are many educational and career opportunities open to you today. Most of these opportunities, however, have strong similarities. This is not the case with West Point. As you page through this catalogue, I urge you to contemplate carefully the advantages that only West Point can offer.

WILLIAM A. KNOWLTON
Major General, USA
Superintendent

Table of Contents

	<i>Page</i>
MISSION	4
ADMINISTRATION	5
HISTORY	6
ACADEMIC PROGRAM	14
LIBRARY	99
GRADUATE CIVIL SCHOOLING	102
LECTURE PROGRAM	104
MILITARY PROGRAM	110
COUNSELING AND ADVISING	122
RELIGIOUS ACTIVITIES	123
CADET ACTIVITIES	126
INTERCOLLEGIATE ATHLETICS	132
MUSEUM	137
SERVICE LIFE	140
RESEARCH	142
ADMISSIONS	144
APPENDICES	164
INDEX	208

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 leading 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 allowed full pay as second lieutenants from the date of graduation when they are appointed 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.

SUPERINTENDENT:

Major General William A. Knowlton, USA

DEAN OF THE ACADEMIC BOARD:

Brigadier General John R. Jannarone, USA

COMMANDANT OF CADETS:

Brigadier General Sam S. Walker, USA

CHIEF OF STAFF:

Colonel Edwin H. Marks, GS

DIRECTOR OF ADMISSIONS AND REGISTRAR:

Colonel Manley E. Rogers, USA

History of West Point

The United States Military Academy was established officially on 16 March 1802 at West Point, a key Hudson River military fortress during the Revolution, and was opened on 4 July 1802.

Two compelling reasons made the formation of an American military academy at that time both logical and necessary: the experience of the Revolutionary War and the ominous international political situation when Thomas Jefferson became President in 1801.

The experience of the Revolutionary War, during which America had to rely in large part on foreign drillmasters, artilleryists, and trained engineers, made the military and political leaders of the day energetic backers of a military academy. The earliest proposal was in 1776 by Col. Henry Knox who recommended "An Academy established on a liberal plan . . . where the whole theory and practice of fortification and gunnery should be taught." The papers of Gen. Benjamin Lincoln, Gen. Jedediah Huntington, Secretary of War Timothy Pickering, John Adams, Alexander Hamilton, and George Washington mention time and again, the need for an academy. In his annual messages to Congress, Washington always included a plea that the Congress provide facilities for the study of military art. In 1797 in his eighth annual message, for example, he said:

The institution of a military academy is also recommended by cogent reasons. However pacific the general policy of a nation may be, it ought never to be without a stock of military knowledge for emergencies. . . . {The art of war} demands much previous study, and . . . {knowledge of that art} . . . in its most improved and perfect state is always of great moment to the security of a nation. . . . For this purpose an academy where a regular course of instruction is given is an . . . expedient which different nations have successfully employed.

The military academies that "different nations" had "successfully employed" and that Washington likely had in mind were England's Royal Military Academy at Woolwich, founded in 1741, and France's Ecole Polytechnique, founded in 1794. The Royal Military College at Sandhurst in England was founded the same year as our own Academy, 1802. And Washington quite obviously realized that complete independence for America called not only for the severance of political ties from England and the formation of an independent political state, but also for independence in every facet of national

life and culture: in law, religion, agriculture, shipbuilding, trading, manufacturing, and military science. How deeply he continued to feel about the need for an Academy appears in a letter written two days before his death and addressed to Alexander Hamilton:

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; and while I was in the Chair of Government, I omitted no opportunity of recommending it, in my public speeches and other ways, to the attention of the Legislature.

The second compelling reason for the immediate establishment of an American military academy was the ominous international political situation of 1801-02. The previous two decades had been troublesome ones. The weak and ineffectual Articles of Confederation and Perpetual Union, trouble with the Barbary pirates, Shays' Rebellion, boundary disputes, frontier battles, and currency quarrels had plagued the young nation, and now it was threatened by the danger of involvement in the complexities that were coming as an aftermath of the French Revolution of 1789. Public opinion moved toward more energetic national government and better trained armed forces.

So it was that Congress, by its Act of 16 March 1802, authorized a Corps of Engineers, set its strength at five officers and ten cadets, and provided that it be stationed at West Point in the State of New York and constitute a Military Academy.

The garrison site of West Point, consisting of 1,795 acres purchased from Stephen Moore in 1790, had been occupied by the Army since 1778. Hence, barracks and other buildings, while inadequate, were available for housing and instruction, and Maj. Jonathan Williams, grandnephew of Benjamin Franklin and Chief of the Corps of Engineers, who had been appointed as the first Superintendent, was able to open the Academy on 4 July 1802 with ten cadets present.

The initial purpose 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. This last, it should be noted, was advanced at a time when many other American academic institutions looked at the sciences with suspicion and hostility. How well the Academy succeeded in its purpose for the first 10 years of its existence was summarized by the most authoritative historian of that period of American life, Henry Adams. In his *History of the United States* (9 vols., 1889-91), covering the

Jefferson and Madison administrations, Adams offers the tribute that American scientific engineering “. . . owed its efficiency and almost its existence to the military school at West Point established in 1802.”

In the year 1812, the growing threat of war with England impelled Congress to pass the Act of 29 April 1812 by which the strength of the Corps of Cadets was increased to 250, the academic staff was enlarged, and the cadets were placed under the discipline of published regulations. A chaplain was authorized who, in addition to his religious duties, was “to officiate as Professor of Geography, Ethics, and History.” The act required also that the cadets be taught “all the duties of a private, a noncommissioned officer, and an officer.” This requirement, says Emory Upton in *The Military Policy of the United States* (1904), was the “key to the character for efficiency and discipline which the graduates have since maintained.”

The record of the War of 1812 shows that the Academy graduates served their country well. A quarter of the more than 100 — all under 30 years of age — who saw action were killed or wounded; and not one of the fortifications constructed under their direction was captured. Henry Adams was appreciative of their technical skill. “During the critical campaign of 1812,” he wrote, “the West Point Engineers doubled the capacity of the little American army for resistance.”

The experience of the War of 1812 that gave the Nation new self-assurance affected the Academy’s educational aims in the period of peace which followed. No longer was the enemy an immediate threat on our borders; American nationality had been firmly established. National interest called now for canals, roads, railroads, and the development of the soil and its mineral wealth. The accurate mapping of rivers, the deepening of their channels, the constructing of lighthouses and beacon lights — these were needed to make communication easier. And the preliminary work of prospecting and surveying had to be done.

That the Academy graduates of this era were men who through force of character and training could assume leadership in the performance of these tasks was due largely to the genius of Colonel Sylvanus Thayer, Superintendent from 1817 to 1833. The “Father of the Military Academy” had one ideal before him: to produce men who would be trained and worthy leaders. He demanded of the cadets excellence of character and excellence of knowledge, the two integrating qualities of such leadership. But he knew that to achieve his ideal he must master and guide the day-to-day routine of the

Academy, and so it was that he let no detail of character training or discipline, of curriculum content, of textbooks, of teaching methods, of extracurricular activities, or of physical plant escape his attention.

Thayer grasped at once the need of the country for engineers and, therefore, made courses in civil engineering the core of the curriculum. Under his direction, instruction in that subject eventually included the properties, preparations, and use of materials for construction; the art of construction generally, including decorative architecture; the manner of laying and constructing roads; the construction of bridges; the principles regulating the removal of obstructions impeding river navigation; the survey, location, and construction of canals and railroads; and the formation of artificial and the improvement of natural harbors.

A list of the Academy's achievements in the field of civil engineering that can be attributed to the farseeing genius of Thayer would include trigonometrical and topographical surveying; methods of triangulation; magnetic declination; and the systems used in locating, surveying, and dividing the public lands of the United States. Francis Wayland, the president of Brown University from 1827 to 1855, said in 1850 in a report to the Corporation of Brown University that West Point graduates did "more to build up the system of internal improvement in the United States than [the graduates of] all other colleges combined."

To provide objective criticism of his work, Thayer had the aid of a Board of Visitors. A regulation for the Government of the Military Academy, approved by Secretary of War William H. Crawford on 1 July 1815, provided for the appointment of such a Board to consist of five "competent gentlemen," with the Superintendent as President, who should attend at each of the annual and semiannual examinations and report thereon to the Secretary. This excellent custom of having a Board of Visitors has lasted to the present day. From the beginning their criticism was pertinent and helpful; nor is this surprising when the long list of those who have been members is scanned, for thereon appear the names of men like Edward Everett, George Bancroft, George Ticknor, Horace Mann, and Daniel Coit Gilman. Thayer knew the value of the intelligent lay point of view and welcomed the Board's comments on his curricular shift to civil engineering, his innovations in educational method, and his system in general.

His innovations in educational methods insured that the cadets not only learned but retained their subjects. Basically, he demanded that

the cadets develop habits of mental discipline and maintain standards of scholarship that have grown in importance the more they have been tested through the years. He emphasized habits of regular study, and he laid down the rule that every cadet had to pass every course — and deficiency had to be made up within a specified time or the cadet would be dropped. To carry out these rigorous standards he limited the classroom sections to from 10 to 14 members; he rated these sections in order of merit and directed that cadets be transferred from one to the other as their averages rose or fell.

These methods and standards of Thayer's system are still used at the Academy, and Thayer's insistence on leadership integrated by excellence of character and excellence of knowledge has been the cornerstone of the Academy's training since his day. Emerson, visiting West Point in 1863, spoke of the "air of probity, of veracity, and of loyalty" the cadets had; and when in 1898 the present coat of arms was adopted, the motto thereon of "Duty, Honor, Country" was but a later generation's attempt to put Thayer's ideal into words.

To the casual student it might seem that until about 1860 West Point was filling the almost dual roles of national military academy and of national school of civil engineering. But despite the curricular emphasis on civil engineering and the renown of her graduates in that field, the Academy never forgot her deepest and most abiding obligation to the Nation: to send forth graduates trained in the art and science of war. That the obligation was fulfilled is attested for these early years by the records of the Mexican and Civil Wars. The record of the Mexican War is told best in the words of Gen. Winfield Scott:

I give it as my fixed opinion, that but for our graduated cadets, the war between the United States and Mexico might, and probably would, have lasted some four or five years, with, in its first half, more defeats than victories falling to our share; whereas, in less than two campaigns we conquered a great country and a peace, without the loss of single battle or skirmish.

The record of the Civil War shows that the Confederacy used graduates whenever and wherever possible; the Union, in the beginning, used "political" generals. Defeat after defeat proved the need for professionally trained officers, and, in the last year of the war, all senior commanders of the Union armies were Academy graduates. Grant, Lee, Sheridan, Jackson, to name but a few on both sides, were all from West Point.

After the Civil War, changing conditions necessitated a shift in the Academy's curriculum away from the emphasis on civil engineering. The first Morrill Land-Grant Act of 1862, granting Federal land to each state "for endowment, support, and maintenance of at least one college where . . . military tactics . . . [and] . . . such branches of learning as are related to agriculture and the mechanic arts [shall be taught], enabled American education to be enormously expanded. New technical and engineering schools, supplementing those that had been founded in the second quarter of the nineteenth century, made it possible for West Point to drop its strong emphasis on engineering subjects. But even had these new schools not come into being, the Academy would have found it impossible to keep on producing both adequately trained Army officers and adequately trained engineers. The tremendous expansion of the body of scientific knowledge during these years — the last half of the nineteenth century — was enforcing specialization in all technical fields. And since the science of war also expanded greatly it became obvious that the Army officer would need specialization in his particular branch of service.

The Academy met these changed conditions by severing its direct relationship with the Corps of Engineers; from 1866 on it was no longer mandatory that the Superintendent be a member of that Corps. To meet the officer-specialization demand, several Army postgraduate schools were set up, and West Point gradually came to be looked on as only the initial step in the Army officer's education. As the Academy approached its centennial, the military objective of the curriculum came to be the giving of general instructions in the elements of each military branch.

After its centennial in 1902, the Academy underwent a thoroughgoing structural renovation and became known as the New West Point. Coincident with this reconstruction, Gen. Albert L. Mills, the Superintendent, had the entire curriculum, military and academic, reassessed. As a result, military instruction was transformed from a series of mechanical drills to practical training in minor tactics and field work. Complete correlation was developed between instruction and actual field conditions. One of Mills' special hobbies was English; he believed that the Army officer should be able to express himself clearly in speech and writing. To that end, he strengthened greatly the course in English. A gradual liberalization of the curriculum went on until the outbreak of World War I.

World War I tested and proved, as never before, the soundness of the Academy's curriculum and training. Although in order to meet

the sudden and great demand for trained officers the course was shortened and a number of classes graduated early, the qualities and abilities of the graduates remained high.

After the close of the war, the Academy's further development was placed in the hands of General Douglas MacArthur, who became Superintendent on 12 June 1919. General MacArthur's primary concern was an adaption of the curriculum in terms of the recent war. It was known, for instance, that the concept of total war, new in military history, required cadets to have a knowledge of national production, transportation, and social problems; that something of the new developments in weapons and tactics had to be incorporated into cadet instruction; and that shortcomings in the officers' physical development, seen clearly in the stress of battle, made a longer and more vigorous physical training program necessary. But at the same time it was realized that the tremendous advances in the art and science of war, made under the pressure of actual conflict, presaged further development of Army postgraduate schools and hence a growing emphasis upon a more broadly conceived basic curriculum at West Point. The belief was reached that the Academy would serve best by giving the cadets a combination of general and technical education, in this way providing a solid foundation for a professional military career.

The part of the curriculum General MacArthur changed with the greatest vigor was that relating to physical education. He believed firmly that physical fitness was a basic requirement of an officer, and he planned a strenuous program of compulsory gymnastic instruction complemented by an intramural program of 14 sports in which every cadet had to take part. The wisdom of his foresight has been reflected ever since in the excellent physical condition of all cadets at all times.

Soon after General MacArthur's incumbency the policy of a liberal as well as a technical education got renewed emphasis by the introduction of a course in economics and government under the Professor of English and History. In 1926 the Department of English and History was reorganized into the Department of Economics, Government, and History, and a separate Department of English was established. In succeeding years curricular reforms took place in modern languages, natural philosophy, and mathematics.

All phases of training were greatly intensified during the rearmament years, 1939-41, and the excellence of the curriculum and the methodology of the Academy was clearly demonstrated by the performance of its graduates in World War II.

Much was learned from World War II and Korea. A series of studies and reviews by distinguished educators and military leaders led to revised concepts of what professional military education should mean. A comprehensive analysis conducted from 1956 to 1960 of the entire curriculum and training program resulted in increased emphasis on modern technological advances and the increasingly complex aspects of national security and international relations. Related courses have been coordinated to bring their direction and emphasis into common focus. Because of the increased technological character of the weapons and techniques of war, the coverage of chemistry, nuclear physics, electronics and basic astronautics has been increased. Similarly, the assignment of officers early in their service to friendly foreign countries in military assistant advisory capacities and the greatly increased participation of officers later in their careers in international and national agencies concerned with national security policies has led to improved coverage of geography, history, government, economics, and ideologies of countries throughout the world. In order to challenge each cadet and to enable him to proceed as rapidly as his capabilities permit, the number and scope of advanced courses were expanded, and in order to capitalize on the aptitude and interests of individual cadets, an elective program was introduced.

The academic and military training program is a vital, everchanging one that is continuously examined and adjusted to the changing times, and yet the Academy builds always on the cornerstone of the Thayer system: leadership integrated by excellence of character and excellence of knowledge.

Sylvanus Thayer, Superintendent from 1817 to 1833 and "Father of the Military Academy," was elected to the Hall of Fame for Great Americans, located at New York University, in October 1965. His bust and tablet were unveiled in the auditorium of the Library of New York University on May 15, 1966.

President Johnson signed the bill of March 3, 1964, increasing the maximum authorized strength of the Corps of Cadets from 2529 to 4417. The physical plant of the United States Military Academy is currently expanding and it is expected that both the expansion of the Corps of Cadets and the expansion of the physical plant of the Academy will be completed by 1972.

Academic Program

MISSION

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

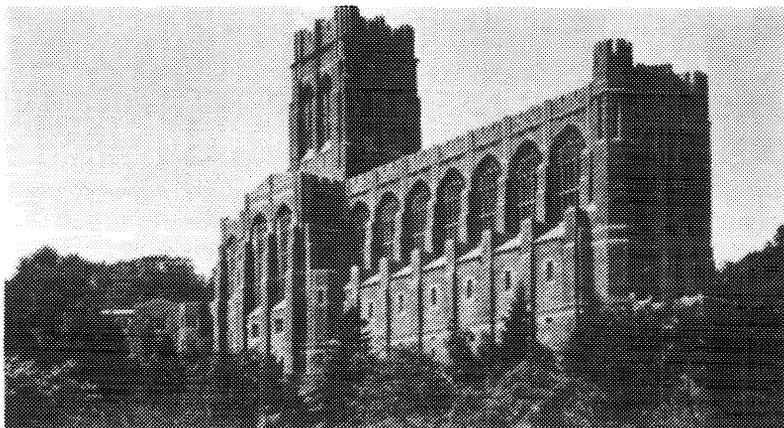
To build an academic foundation for future graduate study.

To stimulate and challenge intellectual curiosity and individual talents.

To develop powers of analysis, reasoning, and expression.

To contribute to the building of character.

	<i>Page</i>
EDUCATIONAL PHILOSOPHY	15
ACADEMIC BOARD	16
ACADEMIC CURRICULUM CORE AND ELECTIVE PROGRAMS	17
AREAS OF CONCENTRATION AND ASSOCIATED ELECTIVE FIELDS	22
ELECTIVE COURSES	23
ACADEMIC DEPARTMENTS	27



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 intramural 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 the granting of 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.

MAJOR GENERAL WILLIAM A. KNOWLTON

Superintendent

BRIGADIER GENERAL JOHN R. JANNARONE

Dean of the Academic Board

BRIGADIER GENERAL SAM S. WALKER

Commandant of Cadets and Head of the Department of Tactics

COLONEL CHARLES R. BROSHOUS

Professor and Head of the Department of Earth, Space and Graphic Sciences

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 H. VOEGTLY

Professor and Head of the Department of Military Hygiene

COLONEL JOHN S. B. DICK

Professor and Head of the Department of Mathematics

COLONEL FREDRICK C. LOUGH

Professor and Head of the Department of Law

COLONEL CHARLES H. SCHILLING

Professor and Head of the Department of Engineering

COLONEL AMOS A. JORDAN, JR.

Professor and Head of the Department of Social Sciences

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 MANLEY E. ROGERS

Director of Admissions and Registrar, and Secretary to the Academic Board

THE USMA ACADEMIC CURRICULUM

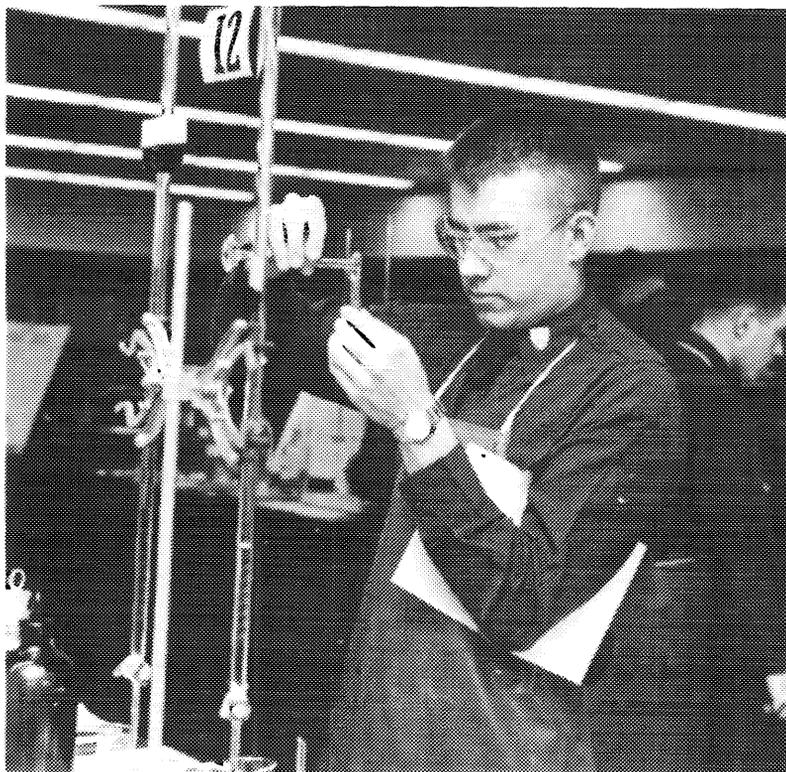
The curriculum offered at the United States Military Academy, leading to a Bachelor of Science Degree, is the product of an evolutionary development which, over the years, has reflected the changing requirements of the military profession and advances in the field of higher education. It includes a combination 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 1969 - 1970

THE CORE ACADEMIC PROGRAM

	First Term	Second Term
Fourth Class (Freshman) Year		
° Mathematics	MA 101	MA 102
° 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 (Elective)
*Physics	PH 201	PH 202
*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 (Elective)
*Mechanics	ME 303	---
*Physics	---	PH 303
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.

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: R-remedial, 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 per week for an eighteen-week term.



METHODS OF INSTRUCTION

Cadets attend classes in small sections of from 12 to 15 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 homogenous 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. Weekly posting of grades contributes much to the development of a competitive spirit in academics among cadets. Reports of each cadet's academic progress are provided to parents twice each term.

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

ELECTIVE COURSES

APPLIED SCIENCE AND ENGINEERING

CE 381	Soil Mechanics
CE 481	Design of Concrete Structures
CE 482	Advanced Structural Analysis
CE 484	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	Advanced 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 481	Gas Dynamics
ME 482	Heat, Mass & Momentum Transfer
ME 483	Space Mechanics
ME 484	Aerospace Structures
ME 485	Continuum Mechanics
ME 486	Mechanical Vibrations
ME 487	Introduction to Applied Aerodynamics
ME 489	Individual Mechanics Project
OE 385	Management Engineering
OE 481	Automotive Engineering
OE 482	Individual Ordnance Project
OE 483	Engineering Materials
OE 487	Operations Research
PH 487	Nuclear Reactor Theory

BASIC SCIENCE

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
EV 388	Physical Geology
EV 489	Individual Research Projects
MA 281	Vector Calculus and Differential Equations
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 487	Nuclear Reactor Theory
PH 488	Nuclear Physics
PH 489	Special Topics in Physics

HUMANITIES

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 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
LC 383	Chinese Literature and Culture I
LC 384	Chinese Literature and Culture II
LC 481	Readings on Chinese Culture
LC 485	Readings in Modern Chinese
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 485	Directed Studies in Portuguese
LP 486	Directed Studies in Portuguese
LR 381	Russian Language through Literature I
LR 382	Russian Language through Literature II
LR 483	Military & Scientific Readings in Russian

- LR 484 Russian Civilization**
- LR 485 Soviet Russian Literature**
- LR 486 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**

NATIONAL SECURITY AND PUBLIC AFFAIRS

- EV 381 Geography of the USSR**
- EV 384 Regional Geography of the U.S.**
- EV 489 Individual Research Projects**
- HI 371 History of Russia**
- HI 372 History of US Foreign Relations**
- HI 381 Revolutionary Warfare**
- HI 382 Evolution of Modern Warfare**
- HI 383 Twentieth Century Warfare**
- 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 383 Middle Eastern Studies**
- SS 384 Latin American Studies**
- SS 385 Comparative Economic Systems**
- SS 386 Political Philosophy**
- SS 387 Seminar in Public Policy**
- SS 388 Macroeconomics**
- SS 389 Managerial Economics**

- SS 482 Economic Analysis: Theory and Defense Applications**
SS 483 National Security Seminar
SS 484 International Economics and Economic Development
SS 485 Problems of the Developing Nations
SS 486 Political and Cultural Anthropology
SS 487 Seminar in Public Policy (Honors - Research)

THE ACADEMIC DEPARTMENTS

OFFICE OF THE DEAN

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. DONALD E. FOWLER, B.S., United States Military Academy; M.S.,
 Harvard University; Army War College

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

PLANS AND PROGRAMS

Plans and Programs Officer, Assistant Professor

MAJ. PAT M. STEVENS, IV, B.S., United States Military Academy; M.S., Uni-
 versity of California at Los Angeles

ADMINISTRATION AND MANAGEMENT DIVISION

Executive Officer, Assistant Professor

MAJ. WILLIAM H. RENO, B.S., United States Military Academy; M.A., M.S.E.,
 Princeton University

Assistant Executive Officer

CPT. C. T. SCHMITT, B.S., United States Military Academy; M.B.A., Columbia
 University

OPERATIONS DIVISION

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COL. JOHN W. MASTIN, B.S., United States Military Academy; M.S., M.E.,
Harvard University

Deputy Director

MR. WILLIAM G. GICKING, B.A., University of Omaha; M.S., University of
Scranton

Chief, Counselling Branch

MAJ. BRIAN V. MCKINLEY, B.S., United States Military Academy; M.B.A.,
Harvard University

Counselling Officer, Assistant Professor

MAJ. MICHAEL B. ALLEN, B.S., United States Military Academy

Systems Analyst

L.T. CARL F. DILL, JR., B.A., Northwestern University; M.S., University of
Illinois

INSTRUCTION SUPPORT DIVISION

Director, Permanent Associate Professor

COL. WILLIAM F. LUEBBERT, B.S., United States Military Academy; M.S.,
E.E.A., Ph.D., Stanford University

Deputy Director, Assistant Professor

LTC. HAROLD C. HANNAWAY, B.A., Boston College; M.B.A., New York
University

ACADEMIC COMPUTER CENTER

Associate Director, Assistant Professor

MAJ. DAVID W. GLEDHILL, B.S., University of Colorado; M.S.E.E., Stan-
ford University

Instructor

CPT. LANSE M. LEACH, B.S., United States Military Academy; M.S., Stan-
ford University

The Academic Computer Center provides its services to all academic departments and activities of USMA for academic-related functions. The services of the Academic Computer Center include providing technical advice and support for instruction in cadet classes and USMA Staff and Faculty courses; operation of the computing facility; and technical consultation to cadets and instructors.

Located on the first floor of Thayer Hall, the Academic Computer Center consists of a large, third-generation computer (GE-635 computer system), a comprehensive time-sharing communications system extending to all academic areas of the Academy, two smaller processors (GE-225 computer systems), and two 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 100 remote computer terminals (teletypewriters) 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. This capability allows the computer's problem-solving and data reduction capabilities to be brought into conventional classrooms, laboratories, lecture halls, and cadet barracks areas located considerable distances from the Academic

Computer Center. When not otherwise in use for direct support of cadet instruction, terminals are available to cadets and instructors for individual problem solving. The Academic Computer Center also uses the capabilities of the USMA closed-circuit television system to display the input and output of a remote teletype terminal to large audiences; has an excellent graphical output capability in its remote analog (X-Y) plotters and Cathode-Ray-Tube Display Computer Terminals; and provides a variety of punched card equipment to include Key-punches, Mark-Sense Card Interpreter/Reproducers, Alphanumeric Interpreters, and a Card Sorter.

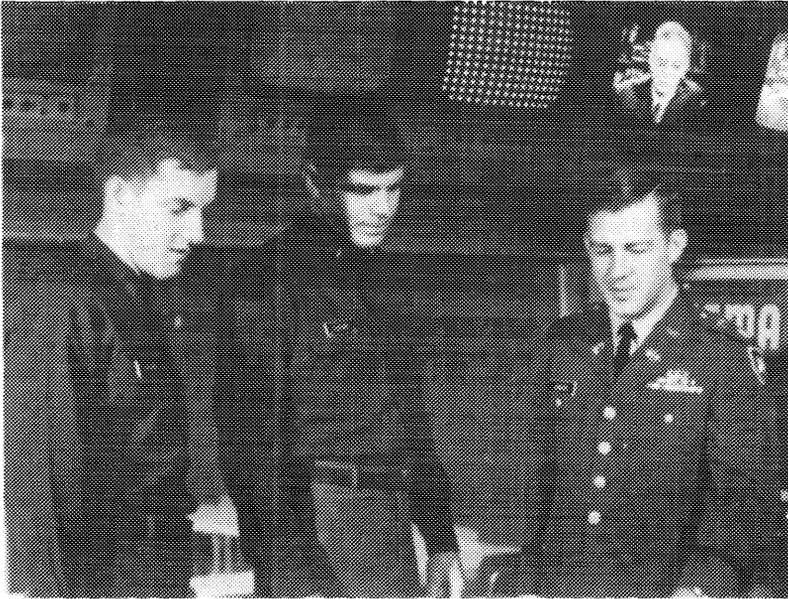
The Academic Computer Center is open 151 hours per week during the Academic Year. Its operation stresses "cadet involvement," which is demonstrated by a "Do-It-Yourself" method of processing cadet computer problems. Using this method, a cadet can run his program personally by using one of the smaller GE-225 computers. All cadets are encouraged to use this method as it permits them to obtain a better appreciation of the computer and gives them better service by reducing turn-around time.

USMA has an interdisciplinary Academic Computer Program designed to accomplish three major goals, which are, briefly stated, as follows:

1. To acquaint each cadet with the capabilities, limitations, and potential of the computer as an increasingly important military tool.
2. To equip each cadet with the ability to perform complex computations rapidly and accurately through intelligent use of the computer.
3. To increase the effectiveness of instructors through use of the computer in a variety of academic disciplines and in many classroom and laboratory situations.

Initial cadet instruction in the use of digital computers occurs during his Fourth Class (freshman) year in courses taught by the Department of Earth, Space, and Graphic Sciences. Each cadet receives instruction in two computer languages. The first of these is a scientific, procedure-oriented language specifically designed to support instruction at USMA, called USMA Standard FORTRAN (a dialect of FORTRAN IV). The second is a relatively new language developed at Dartmouth called BASIC. The basic knowledge is extended through continued computer use in several disciplines. In Mathematics, the cadet is given a series of problems which emphasize fundamental mathematical concepts. The Departments of Physics and Chemistry use the computer as a data reduction tool. The Engineering courses include comparisons of analog and digital computer solutions. The Departments of Electrical Engineering, Mechanics, History, and Social Sciences encourage cadet computer use. Several elective courses allow cadets with particular aptitude to explore computer science in depth. The use of the computer extends into areas outside of the sciences, such as psychology, tactics, and humanities.





INSTRUCTIONAL TECHNOLOGY CENTER

Associate Director, Assistant Professor

MAJ. BILLY R. LAWSON, B.S.E., Arkansas State University; M.S., University of Southern California

Instructor

MAJ. JAMES D. BAKER, B.A., University of Alabama; M.S., University of Southern California

Audio-Visual Production Officer

MR. FURMAN W. BALDWIN, B.A., M.A., University of Buffalo

The United States Military Academy is known for its innovations in educational techniques, and its use of educational resources. A potent educational tool is closed-circuit instructional television. At the Military Academy, instructional television is used as an adjunct to the classroom instructor. Department instructors are developing many new and original methods of using television in a way that integrates its capabilities into time-tested methods of instruction.

Facilities of the Instructional Technology Center include a modern well-equipped studio and control room with studio cameras, professional video tape recorders, slide and motion picture equipment, special effects generators, etc. It also has a limited capability to produce educational films, especially single-concept films, and multi-image and multi-media instructional programs. A distribution system of cables and the necessary amplifiers carry the instructional program into over 350 classrooms — all of the classrooms in Thayer, Bartlett and Washington Halls — and to the Library and Hospital. Large screen television is available in auditoriums and lecture halls.

As a complement to the studio, which allows the production of professional quality instruction programs, the Center also operates three sets of portable equipment, which are designed to permit candid videotaped recordings for classroom critique. The cadets may operate this television equipment after receiving training.

INSTRUCTOR GROUP

Chief, Assistant Professor

LTC. FRANK E. SHARER, B.S., United States Military Academy; M.S.E., Arizona State University

Instructors

MAJ. ROBERT G. KAISER, B.S., University of Detroit; M.S.E.E., Stanford University

MAJ. DENNIS D. WILLIAMS, B.S., University of South Dakota; M.S., University of Southern California

LT. FREDERICK H. SIFF, B.S., Worcester Polytechnic Institute; M.S., Ph.D., New York University

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 and a voluntary, 25-lesson, self-paced program on a space-available basis.

The Dean's Program in Special Skills is a program of academic instruction taught by the Instructor Group and participating academic departments to USMA faculty and staff. Typical courses taught are basic and advanced computer programming (e.g., FORTRAN, COBOL, BASIC), numerical analysis and war gaming. The Dean's Program in Special Skills is offered each Academic Term with courses lasting from four to fifteen weeks.

The Computer Program Library and Reference Library for which the Instructor Group is responsible contain reference material of general-usage programs written in FORTRAN and BASIC, and an excellent collection of textbooks in the areas of computer programming (FORTRAN, BASIC, SNOBOL, ALGOL, PL/1, COBOL, etc.), computer applications and algorithms, data processing and information retrieval, instructional technology and media, and reading development. They are operated as a sub-element of the USMA Library and all material is available on temporary loan.

OFFICE OF PHYSICAL EDUCATION

Permanent Professor and Director of Physical Education

COL. FRANK J. KOBES, JR., B.S., United States Military Academy; B.A., Doane College; M.A., New York University

Deputy Director

LTC. WALTER C. ANHALT, B.Ed., University of Omaha

Chief of Instruction

MAJ. HERMAN T. EUBANKS, B.S., United States Military Academy; M.A., Indiana University

Associate Professors

MAJ. MICHAEL T. PLUMMER, B.S., United States Military Academy; M.S., Indiana University

MR. ROBERT E. SORGE, B.S., Shippensburg State Teachers College; M.A., Columbia University

MAJ. ELIOT V. PARKER, JR., B.S., United States Military Academy; M.S., Wisconsin University

MR. JOHN B. KRESS, B.S., Teachers College, Columbia University; M.A., Teachers College, Columbia University

MR. HERBERT J. KROETEN, B.A., University of Minnesota; M.Ed., Ohio State University

Assistant Professors

MAJ. RICHARD A. BUCKNER, B.S., United States Military Academy; M.S., Wisconsin University

MR. GEORGE W. LINCK, B.S., Springfield College; M.A., Teachers College, Columbia University

Instructors

MAJ. HOWARD P. BLOUNT, B.S., North Georgia College

MAJ. ROBERT B. CAIRNS, B.S., United States Military Academy; M.S., Wisconsin University

MAJ. PATRICK L. CANARY, B.S., United States Military Academy; M.S., Indiana University

MAJ. MICHAEL E. EKMAN, B.S., United States Military Academy; M.S., Indiana University

MAJ. RODNEY F. GRANNEMANN, B.S., United States Military Academy

MAJ. WILLIAM A. JUERGENS, B.S., Wisconsin University

MAJ. WILLIAM F. LADD, B.S., Wheaton College; M.S., Indiana University

MAJ. FLOYD H. McAFEE, B.S., University of Illinois; M.S., Indiana University

MAJ. JOSEPH D. NUNNELEE, B.S., United States Military Academy; M.S., Indiana University

MAJ. BEVERLEY E. POWELL, JR., B.S., United States Military Academy

MAJ. FRED E. REDD, B.S., Southwest Missouri State University; M.A., Southwest Missouri State University

MAJ. EMIL M. ROPER, B.S., University of California, Los Angeles

MAJ. CHARLES L. WUERPEL, B.S., United States Military Academy; M.S., Wisconsin University

CPT. DENNIS S. FORBES, B.S., Wichita State University; M.A., Wichita State University

CPT. ROBERT L. SLOANE, B.S., United States Military Academy; M.S., Wisconsin University

CPT. JAMES B. STAPLETON, B.S., United States Military Academy

CPT. HERBERT G. VAUGHAN, B.S., United States Military Academy; M.S., Indiana University

1LT. WILLIAM E. KETCHAM, B.S., Indiana University; M.S., Indiana University

2LT. JAMES P. BRIK, B.A., Idaho State University; M.P.E., Idaho State University

2LT. ROBERT W. ZOLL, B.S., Indiana University; M.S., Indiana University

MR. LEROY A. ALITZ, B.A., University of Iowa; M.A., University of Iowa

MR. JOHN D. LEMPERLE, B.S., University of Utah; M.S., Idaho State University

MR. WILLIAM F. LEWIS, B.S., Springfield College; M.A., New York 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., Teachers College, Columbia University

SP RICHARD C. BURMANN, B.S., Ball State University
SP ROBERT W. CARGILL, B.S., Springfield College
SP ROBERT G. DAVIS, B.A., University of North Carolina
SP MICHAEL D. STANLEY, B.A., Adams State College

Trainers

SP RICHARD L. SANDOVAL, B.S., Kansas State Teachers College; M.S.,
Southwest Missouri State University

Physical Education courses are designed to increase muscular strength, power, endurance, cardiovascular endurance, fundamental coordination, balance and flexibility; to enhance mental health and efficiency; and to develop the personal requisites necessary for military effectiveness and leadership.

Standard Courses

PE 100. FOUNDATIONS IN PHYSICAL EDUCATION

This course emphasizes the development of basic physical ability through instructional participation in boxing, gymnastic, swimming and wrestling interspersed with lectures on applied physiology. Instruction is provided in the carry over sports of golf and tennis. Accelerated students participate in handball and squash. Standards of physical performance must be met. *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 includes instruction and experience in conducting conditioning exercises and allied physical training activities. Standards of physical performance must be met. *1.5 Credit Hours.*

PE 300. SPORTS LEADERSHIP

This course places emphasis on leadership instruction and experience. Further instruction is given in sports skills, instructor preparation, coaching techniques and athletic coaching experience. Standards of physical performance must be met. *1.5 Credit Hours.*

PE 400. ADVANCED SPORTS LEADERSHIP AND ATHLETIC SKILLS

The objective of this course is the development of instructor and leadership training through the administration of third and fourth class summer physical training program. Instruction for the further expansion of the individual repertory of individual and team sports is provided. Emphasis is placed on carry over athletic skills which promote physical fitness. Standards of physical performance must be met. *1 Credit Hour.*

Additional Courses

INDIVIDUAL INSTRUCTION

Special program of instruction 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.

INTRAMURAL ATHLETIC PARTICIPATION

The intramural athletic program is scheduled in three seasons, fall, winter, and spring. Cadets not on intercollegiate teams are required to participate under PE 100, 200, 300 and 400. The program consists of eighteen sports consistent with physical education objectives to provide broad sports experience, to promote physical activity and to provide leadership experience in athletics.

ANNUAL PHYSICAL FITNESS TESTS

Physical Fitness Tests, Physical Ability Tests, Obstacle Course Runs and Physical Combat Proficiency Tests are conducted in the fall and spring of each year. Performances are graded under PE 100, 200, 300 and 400.

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

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

COL. CHARLES R. KEMBLE, B.S., United States Military Academy; M.A., University of Pennsylvania; Ph.D., George Washington University

LTC. THOMAS E. BLAGG, B.S., Arkansas State College; M.A., Indiana University

LTC. PAUL W. CHILD, JR., B.S. United States Military Academy; M.A., Boston College

LTC. WILLIAM C. HAPONSKI, B.S., United States Military Academy; M.A., Ph.D., Cornell University

LTC. LLOYD J. MATTHEWS, B.S., United States Military Academy; M.A., Harvard University

Assistant Professors

LTC. BEVERLY L. BARGE, B.S., Wake Forest College; M.A., University of North Carolina

LTC. ROBERT L. MERRICK, B.S., United States Military Academy; M.A., Columbia University

MAJ. ANTHONY H. BLACKSTONE, B.S., United States Military Academy; M.A., Columbia University

MAJ. STANLEY J. DELIKAT, B.S., United States Military Academy; M.A., University of Pennsylvania

MAJ. RICHARD B. DALUGA, B.S., United States Military Academy; M.A., University of Massachusetts

MAJ. WILLIAM B. GARD, B.S., Texas A & M; M.A., Columbia University

MAJ. HARRY J. HARTKE, III, B.A., University of Dayton; M.A., Indiana University

MAJ. PAUL C. HUTTON, III, B.S., United States Military Academy; M.A., University of Pennsylvania

MAJ. JOHN J. MADIGAN, III, B.S., United States Military Academy; M.A.,
University of Virginia
MAJ. KARL E. OELKE, B.S., United States Military Academy; M.A., Columbia
University
MAJ. HAROLD B. SMITH, B.S., United States Military Academy; M.A., Uni-
versity of Massachusetts
CPT. JOHN F. CONNOLLY, A.B., St. Anselms College; M.A., Boston College

Instructors

LTC. JOSEPH R. CARRAWAY, B.S., United States Military Academy; M.A.,
University of North Carolina
MAJ. PHILLIP L. BLAKE, B.S., United States Military Academy; M.A., Uni-
versity of Virginia
MAJ. ARTHUR F. BONDSHU, B.S., United States Military Academy; M.A.,
Columbia University
MAJ. GORDON T. BRATZ, B.S., South Dakota State University; M.A., Uni-
versity of Massachusetts
MAJ. DAN H. CAMPBELL, B.S., United States Military Academy; M.A., Indi-
ana University
MAJ. RICHARD D. CHEGAR, B.S., United States Military Academy; M.A.,
Indiana University
MAJ. BENJAMIN W. COVINGTON, III, B.S., United States Military Academy;
M.A., Columbia University
MAJ. DONALD A. DESAPRI, B.S., United States Military Academy; M.A.,
Indiana University
MAJ. BENJAMIN E. DISHMAN, B.S., United States Military Academy; M.A.,
University of Massachusetts
MAJ. JERE K. FORBUS, B.S., United States Military Academy; M.A., Uni-
versity of Massachusetts
MAJ. HERBERT C. HERTEL, JR., B.S., United States Military Academy; M.A.,
University of Massachusetts
MAJ. PAT C. HOY, II, B.S., United States Military Academy; M.A., University
of Pennsylvania
MAJ. BARNWELL I. LEGGE, B.S., United States Military Academy; M.A.,
Columbia University
MAJ. DAVID L. MILLER, JR., B.S., United States Military Academy
MAJ. JULIAN M. OLEJNICZAK, B.S., United States Military Academy; M.A.,
University of Wisconsin
MAJ. JAMES C. PETERSON, B.S., United States Military Academy; M.A., Uni-
versity of Pennsylvania
MAJ. ROBERT B. ROSENKRANZ, B.S., United States Military Academy; M.A.,
University of Pennsylvania
MAJ. TAREY B. SCHELL, B.S., United States Military Academy; M.A., Uni-
versity of Pennsylvania
MAJ. ROBERT C. STIEPOCK, B.A., University of Scranton; M.A., Columbia
University
MAJ. JAMES L. TEDRICK, B.S., United States Military Academy
MAJ. JOHN P. YEAGLEY, B.S., United States Military Academy; M.A., Uni-
versity of Massachusetts
CPT. DEAN E. DOWLING, B.S., United States Military Academy, M.A.,
Columbia University

- CPT. ARTHUR M. KELLY, JR., B.S., United States Military Academy; M.A., Columbia University
- CPT. ALTON D. MORRIS, B.S., West Texas State College
- CPT. JERRY M. SOLLINGER, B.A., University of Pittsburgh; M.A., University of Pittsburgh
- CPT. LOUIS J. STURBOIS, III, B.S., United States Military Academy; M.A., Indiana University
- CPT. ROBERT A. VOGEL, B.S., United States Military Academy; M.A., Cornell University
- ILT. FRANCIS M. LAZARUS, B.A., Canisius College; M.A., Ph.D., Cornell University
- ILT. WILLIAM F. ROGERS, A.B., Yale University; Ph.D., University of North Carolina

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

First Term — Prerequisites: EN 102 or EN 152

This course examines representative works of literature of the Western world, giving primary emphasis to major recurring human themes. While studying form and content of the assigned works, the student continues to improve writing skill by preparing a research paper and shorter compositions. He practices effective speaking by participating in classroom discussion of the assigned readings. Among the authors included in the course are Homer, Sophocles, Chaucer, Shakespeare, Milton, Goethe, and Conrad. *2.5 Credit Hours*

EN 402. ADVANCED EXPOSITION: READINGS IN PHILOSOPHY

Second Term — Prerequisites: EN 201

This course consists essentially of an investigation into man's efforts to understand himself and the world in which he lives. The course readings fall into three general subject areas — religion, philosophy, and science — and range from Plato to Bertrand Russell. They illustrate both the continuing nature of man's problems and their contemporary significance. *2.5 Credit Hours.*

Advanced Courses

EN 151. AMERICAN THOUGHT AND LITERATURE TO 1860

First Term — Prerequisites: None

Fourth Classmen who demonstrate that they have already reached a certain high level of proficiency in reading and writing may study this course. Important ideas of America's serious, creative thinkers come under scrutiny. Among the writers studied are Taylor, Edwards, Franklin, Jefferson, Cooper, Freneau, Emerson, Thoreau, Hawthorne, Melville, and Poe. *2.5 Credit Hours.*

EN 152. AMERICAN THOUGHT AND LITERATURE SINCE 1860

Second Term — Prerequisites: EN 101 or EN 151

Selected Fourth Classmen may continue to pursue the goals of EN 151 in this course. Of particular concern is the attempt to apprehend the development of recent American thought. Among the writers studied are Whitman, Twain, Howells, Crane, James, Dickinson, Frost, Robinson, Eliot, Fitzgerald, Lewis, O'Neill, Hemingway, Faulkner, Steinbeck, Miller, Albee, and Roth. *2.5 Credit Hours.*

Elective Courses

EN 381. ENGLISH LITERATURE FROM THE BEGINNINGS TO 1660

First Term — 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 THE PRESENT

Second Term — 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, Joyce, and Dylan Thomas. *2.5 Credit Hours.*

EN 383. CONTEMPORARY LITERATURE

First Term — 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, Cary, Hardy, Yeats, Eliot, Auden, Ibsen, Chekhov, Shaw, Strindberg, Pirandello, and Brecht. *2.5 Credit Hours.*

EN 384. AMERICAN LITERATURE OF THE NINETEENTH CENTURY

Second Term — 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

First Term — 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

Second Term -- 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

First Term -- 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

Second Term -- 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 485. SEMINAR IN MAJOR BRITISH AUTHORS

Either Term -- Prerequisites: EN 201 and EN 382 or EN 383

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

Either Term -- Prerequisites: EN 201 and EN 383 or 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

First Term -- 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

Second Term -- 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.*

DEPARTMENT OF CHEMISTRY

Professor and Head of Department

COL. DONALD G. MACWILLIAMS, B.S., United States Military Academy;
M.S., The Ohio State University; Ph.D., Rensselaer Polytechnic Institute

Associate Professors

LTC. WILFORD J. HOFF, JR., B.S., The Citadel; M.A., Ph.D., Princeton
University

MAJ. JAMES J. KERNAN, B.S., United States Military Academy; M.S., Johns
Hopkins University

Assistant Professors

MAJ. FRANCIS M. DUREL, B.S., Spring Hill College, M.S., University of Ala-
bama

MAJ. JOHN H. GETGOOD, B.S., United States Military Academy; M.S., Johns
Hopkins University

MAJ. GERALD R. JILBERT, B.S., United States Military Academy; M.S., Uni-
versity of Virginia

MAJ. PETER J. OFFRINGA, B.S., United States Military Academy; M.S., Uni-
versity of California

MAJ. HARRY G. RENNAGEL, B.S., United States Military Academy; M.S.,
Pennsylvania State University

MAJ. JAMES H. SHEGOG, B.S., Central State College; M.S., The Ohio State
University

MAJ. KENNETH C. ZAHN, B.S., B.S.Ed., M.S., University of Arizona; Ph.D.,
University of Illinois

CPT. BRUCE F. MILLER, B.S., United States Military Academy; M.S., Penn-
sylvania State University

Instructors

MAJ. RAY W. BILLS, B.S., M.S., Utah State University; Ph.D., Washington
State University

MAJ. STANLEY M. CLOUGH, B.S., United States Military Academy; M.S.,
Pennsylvania State University

MAJ. THOMAS J. HAYCRAFT, B.S., United States Military Academy; M.S.,
United States Naval Postgraduate School

MAJ. MARVIN A. HEIN, B.S., Trinity University; M.S., Johns Hopkins Uni-
versity

MAJ. JOHN W. HUNT, B.S., University of Florida; M.S., United States Naval
Postgraduate School

MAJ. JOHN C. McNERNEY, B.S., United States Military Academy; M.S.,
Rensselaer Polytechnic Institute

MAJ. DAVID L. MUNDT, B.S., United States Military Academy; M.S., Rens-
selaer Polytechnic Institute

MAJ. ROBERT D. ORTON, B.S., University of Texas; M.S., Rensselaer Poly-
technic Institute

MAJ. JOHN B. ZIMMERMAN, B.S., United States Military Academy; M.S.,
Pennsylvania State University

CPT. ROBERT C. PALMER, B.S., United States Military Academy; M.S., Rens-
selaer Polytechnic Institute

CPT. JERRY L. SELF, B.S., North Carolina State University; M.S., Pennsylv-
ania State University

CPT. TIMOTHY R. YOUNG, B.S., United States Military Academy; M.S., Johns
Hopkins University



Standard Course

CH 201–202. GENERAL CHEMISTRY

A two-semester course in general college chemistry with particular 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. *8 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, complexions, 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. *8 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. 8 *Credit Hours*.

CH 481–482. PHYSICAL CHEMISTRY

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

A course relating certain theoretical aspects to the laws of chemical interaction. The coverage includes such standard topics in physical chemistry as: description of physicochemical systems, chemical thermodynamics, solutions and phase equilibrium, kinetics, changes of state, the phase rule, conductance and ionic equilibria, electrochemistry, quantum chemistry, and spectroscopy. The laboratory program includes experiments which illustrate the fundamental topics through precision measurements, including the application of ultra-violet, visible and infrared spectroscopy. The digital computer is extensively used for automatic data reduction and error analysis in laboratory work. 8 *Credit Hours*.

CH 485–486. HUMAN BIOLOGY

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

A course which 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. CHARLES R. BROSHOUS, B.S., United States Military Academy; M.S.,
University of California

Professor and Deputy 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. JAMES N. ELLIS, B.S., United States Military Academy; M.S., University of Illinois

LTC. JOHN B. GARVER, JR., B.S., United States Military Academy; M.A., Syracuse University

LTC. WILLIAM B. ROGERS, B.S., University of Tennessee; M.A.E., University of Florida

MAJ. SAMUEL J. NEWSOM, JR., B.S., United States Military Academy; M.S., University of Illinois

MAJ. JAMES E. RUPP, B.S., Arizona State University; M.A., University of Michigan

MAJ. CHARLES B. STONE, IV, B.S., United States Military Academy; M.S., University of Illinois

Assistant Professors

MAJ. FRANK M. ALLEY, JR., B.S., North Carolina State College; M.S., University of Wisconsin

MAJ. STANLEY BACON, JR., B.S., United States Military Academy; M.A., Syracuse University

MAJ. JAMES W. DOHERTY, B.S., United States Military Academy; M.S., Georgia Institute of Technology

MAJ. ROBERT G. FINKENAU, JR., B.S., United States Military Academy; M.S., University of Southern California

MAJ. ROBERT FOYE, JR., B.S., United States Military Academy; M.S., Texas A&M College

MAJ. PETER J. GROH, B.S., United States Military Academy; M.S., Purdue University

MAJ. WILLIAM G. HANNE, B.S., United States Military Academy; M.S., University of Illinois

MAJ. ROBERT A. HEWITT, JR., B.S., United States Military Academy; M.A., Syracuse University

MAJ. JOHNNY R. HUBBARD, B.S., United States Military Academy; M.S., University of Illinois

MAJ. RICHARD W. IRWIN, B.S., United States Military Academy; M.S., Air Force Institute of Technology

MAJ. ROBERT E. KLEIN, B.S., United States Military Academy; M.A., Syracuse University

MAJ. VICTOR T. LETNOFF, B.S., United States Military Academy; M.A., University of Texas

MAJ. HENRY E. McCracken JR., B.S., United States Military Academy; M.S., University of Wisconsin

MAJ. JOHN S. OTT, B.S., Stanford University; M.S., Georgia Institute of Technology

MAJ. PATRICK F. PASSARELLA, B.S., United States Military Academy; M.A., University of Michigan

MAJ. JACK A. PELLICCI, B.S., United States Military Academy; M.S., Georgia Institute of Technology

MAJ. JOHN A. RAYMOND, B.S., United States Military Academy; M.A., Syracuse University

MAJ. ROBERT G. RHODES, B.S., United States Military Academy; M.A., Syracuse University

MAJ. ROBERT W. SHOHAN, B.A., M.A., University of Texas

MAJ. RICHARD P. SKOWRONEK, B.S., United States Military Academy; M.S., University of Southern California

MAJ. WILLIAM S. TOZER, B.S., United States Military Academy; M.S., University of Southern California

MAJ. JAMES E. WALSH, JR., B.S., United States Military Academy; M.S., University of Illinois

MAJ. WILLIAM R. WILLIAMSON, B.S., United States Military Academy; M.S., University of Illinois

CPT. GEORGE R. BESSETT, B.S., Florida State University; M.A., Syracuse University

CPT. WILLIAM V. CESARSKI, B.S., United States Military Academy; M.S., Massachusetts Institute of Technology

CPT. WILLIAM A. ROBINSON, B.S., United States Military Academy; M.A., University of Michigan

Instructors

MAJ. ARTHUR S. BROWN, B.S., United States Military Academy; M.S., Ohio State University

MAJ. DONALD A. CAMPBELL, B.S., Pennsylvania State University; M.S., University of Arizona

MAJ. TYRUS R. COBB, JR., B.S., United States Military Academy; M.A., University of Texas

MAJ. JOHN H. DILLEY, JR., B.S., United States Military Academy; M.S., Ohio State University

MAJ. JAMES B. FAIRCHILD, B.S., United States Military Academy; M.A., University of Michigan

MAJ. RICHARD J. GALLIERS, B.S., Ohio State University; M.A., University of Michigan

MAJ. MARK LOWRY, II, B.S., United States Military Academy; M.A., Syracuse University

MAJ. DAVID H. MACE, B.S., United States Military Academy; M.S., Ohio State University

MAJ. THOMAS H. MAGNESS, III, B.S., United States Military Academy; M.S., University of Wisconsin

MAJ. JAMES P. MCGINNIS, B.S., United States Military Academy; M.S., Georgia Institute of Technology

MAJ. CASSIUS J. MULLEN, B.S., United States Military Academy; M.S., Georgia Institute of Technology

MAJ. ROBERT E. OSWANDEL, B.S., United States Military Academy; M.S., Georgia Institute of Technology

MAJ. DAVIES R. POWERS, B.S., United States Military Academy; M.S., University of Arizona

MAJ. RONALD A. PISTONE, B.S., United States Military Academy; M.S., University of Southern California

- MAJ. FRANCIS R. SCHARPF, B.S., United States Military Academy; M.A., Syracuse University
- MAJ. KENNETH M. WALLACE, B.S., United States Military Academy; M.S., University of Arizona
- 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
- CPT. ROBERT H. O'TOOLE, B.S., United States Military Academy; M.S., Stanford University
- CPT. LYNNE M. PATTEN, B.S., United States Military Academy; M.S., Georgia Institute of Technology
- CPT. GLENN N. SMITH, B.S., United States Military Academy; M.S., Ohio State University

Standard Courses

EF 101. ENGINEERING FUNDAMENTALS I

First Term – Prerequisites: None

An introduction to engineering graphics and its applications to communication, analysis, and design. Includes use of the drafting instruments, technical sketching, orthogonal projection, engineering conventions, basic mechanical elements, and manufacturing processes. Emphasis is on original thought and conceptual design. The slide rule is introduced early in the course, and study of its theory and applications continues throughout the course. *2.5 Credit Hours.*

EF 102. ENGINEERING FUNDAMENTALS II

Second Term – Prerequisite: EF 101

Two thirds of the course is an introduction to the use of the electronic digital computer with emphasis on programming in the FORTRAN and BASIC languages. Practical exercises in the computer laboratory develop and reinforce fundamental concepts. The remaining one third of the course includes sub-courses in graphical analysis and an introduction to surveying, the basic measurements, and the instruments used. Slide rule study and practice continues with applications involving powers and roots with the log-log scales and combined operations. *2.5 Credit Hours.*

EV 101. PLANETARY SCIENCE

Either Term – Prerequisites: None

The course treats certain physical aspects of earth and atmospheric science which pertain to the earth as a planet forming a framework for the study of the other members of the solar system. Special emphasis is also given to the development of man's concept of the universe. A portion of the course uses the principles of Newtonian mechanics to examine man's continuous exploration of space. *2.5 Credit Hours.*

EV 102. WORLD REGIONAL GEOGRAPHY

Either Term – Prerequisites: None

An introductory study of the complexities and diversities of man's environment. This course provides greater understanding of man's environment by examining from a geographic perspective the variety of world, physical and cultural phenomena and their complex spatial relationships. This approach is used as a basis for systematically analyzing and comparing contemporary world regions. *2.5 Credit Hours.*

Advanced Courses

EF 151. ADVANCED ENGINEERING FUNDAMENTALS I

Prerequisite: Validation of EF 101

An advanced course for selected cadets who have completed a minimum of one year college-level engineering graphics and demonstrated a satisfactory degree of proficiency on a validation examination. Two basic subject areas are covered: (1) computer programming in the FORTRAN and BASIC languages; (2) an advanced level study of descriptive geometry and vector geometry. Graphical techniques are reviewed and an introduction to the design and construction of the slide rule is presented at the beginning of the course. *2.5 Credit Hours.*

EF 152. ADVANCED ENGINEERING FUNDAMENTALS II

Prerequisite: EF 151

A study in depth of specific fields of engineering interest as an individual and as a member of a team. Problems are derived from architecture, cartography, mechanical design, computer graphics, or other pertinent engineering science fields. The study is enriched by consultation with and guest appearances of practicing engineers, both military and civilian. The course concludes with an interchange of ideas through project presentations and discussions led by cadets. *2.5 Credit Hours.*

EV 151. ADVANCED PLANETARY SCIENCE

First & Second Term -- Prerequisite: Strong foundation in physics, astronomy, or earth sciences.

An advanced course for cadets with high aptitude and above average preparation in physics, astronomy, or earth sciences. The course encompasses the subject matter of EV 101, but the coverage is accelerated and in greater depth with additional studies in astronautics, geophysics, and stellar astronomy. *2.5 Credit Hours.*

Elective Courses

EF 382. COMPUTER SCIENCE FUNDAMENTALS

First & Second Term -- Prerequisite: EF 102 or 151

A comprehensive introduction to the computer science field with emphasis on programming in the FORTRAN 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. The course features a term problem and four-hour battalion level "war game." *2.5 Credit Hours.*

EF 383. DATA CONTROL AND PROCESSING WITH COBOL

First & Second Term -- Prerequisite: EF 102 or 151

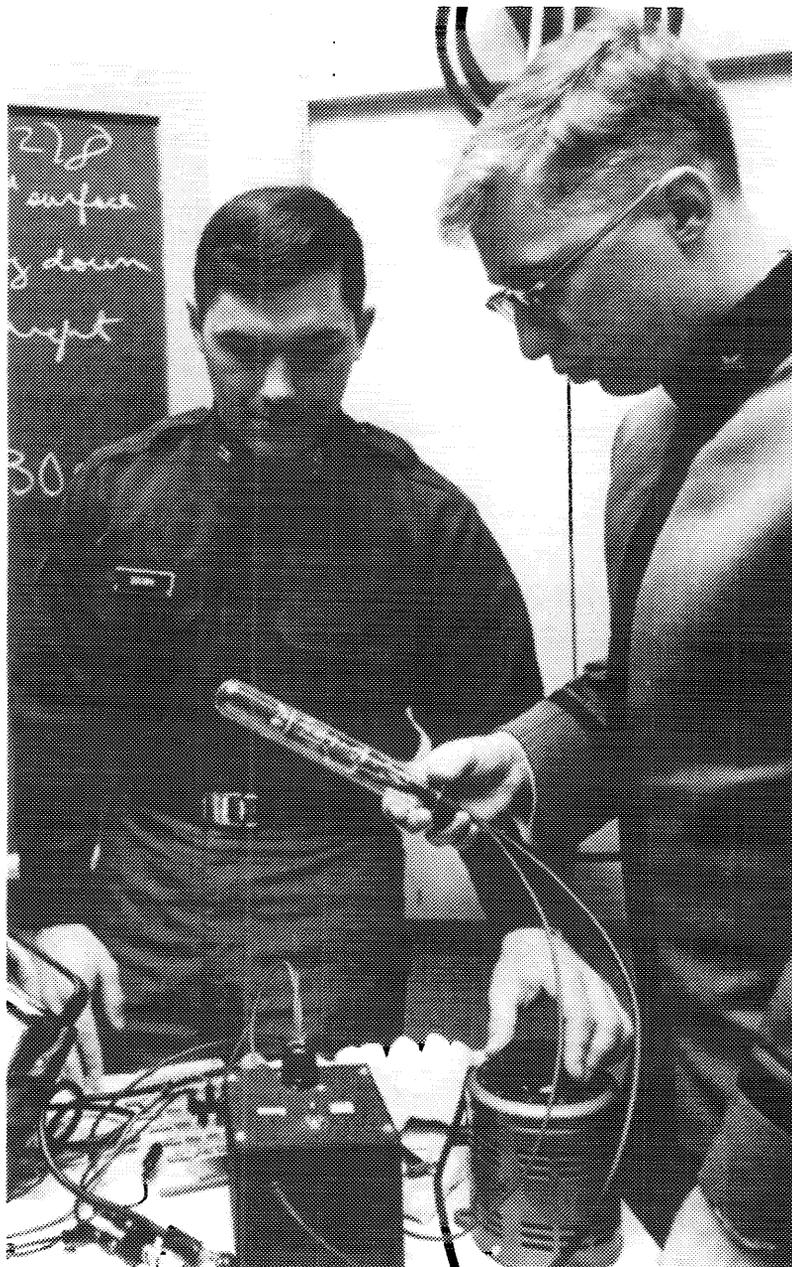
A comprehensive introduction to the COBOL programming language and its application to large-scale data control and processing techniques. The course includes the COBOL programming techniques for creating, maintaining, and processing files of management data, the structure of data files necessary to accommodate 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

Develops a knowledge of basic surveying principles and introduces modern advanced surveying equipment and techniques. Use of traditional hardware in making measurements of horizontal and vertical distance and horizontal and vertical angles is applied to the principles of route construction and topographic surveying. Modern surveying techniques and equipment are used in a study of

position determination by astronomical observations, principles of photogrammetry, electronic distance measuring, and the application of the computer in surveying calculations. Course features a comprehensive field problem. 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 digital computer using advanced programming techniques. An individual project and formal instruction are the teaching media. *2.5 Credit Hours.*

EV 381. GEOGRAPHY OF THE USSR

First Term — Prerequisite: EV 102

Covers the demographic, physiographic, climatic, agricultural, industrial, transportation, and mineral resource patterns of the USSR. Geographic factors — cultural, economic, and physical — are related to the human activity in agriculture and industry. *2.5 Credit Hours.*

EV 383. SPACE SCIENCE

First Term — Prerequisites: 1st or 2nd Classmen in upper two-thirds of class in third class mathematics and physics. Open to other cadets with consent of instructor.

A course providing familiarization with geophysics and astrophysics through a detailed examination of the solar system and other selected topics related to the study of the universe as a whole. It provides both description and analytical views of man's environment beyond earth. *2.5 Credit Hours.*

EV 384. REGIONAL GEOGRAPHY OF THE UNITED STATES

Second Term — Prerequisite: EV 102

A regional analysis of the major economic subdivisions of the United States. Through a study of demographic, physiographic, climatic, resource, and cultural factors, the cadet gains an understanding of our existing industrial, agricultural and transportation patterns. This study provides a firm foundation in the methods of geographic analysis which may be extended to any other region of the world. *2.5 Credit Hours.*

EV 388. PHYSICAL GEOLOGY

Second Term — Prerequisite: EV 101–102

This course presents the major geologic processes and principles which have controlled the origin and evolution of the earth. Emphasis is placed on evaluation of processes, and the concepts are discussed with a minimum amount of mathematical and astronomical analysis. *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. *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. STANLEY E. REINHART, JR., B.S., United States Military Academy;
M.S.E.E., Ph.D., Georgia Institute of Technology

Professors

- COL. ROBERT B. ANDREEN, B.S., United States Military Academy; M.S.E.E., Ph.D., Georgia Institute of Technology
MAJ. JOHN J. RAMSDEN, B.S., United States Military Academy; M.S.E., Purdue University

Assistant Professors

- MAJ. ROBERT H. AMMERMAN, JR., B.S., United States Military Academy; M.S.E.E., Georgia Institute of Technology
MAJ. ROY F. BUSDIECKER, JR., B.S., United States Military Academy; M.S.E.E., Stanford University
MAJ. JOHN L. GEISINGER, B.S., M.S.E.E., University of Illinois
MAJ. JACK T. HUMES, B.S., United States Military Academy; M.S.E.E., Arizona State University
MAJ. ROBERT H. IWAI, B.S., University of Hawaii; M.S.E.E., Stanford University
MAJ. MARSHALL L. MOORE, B.S., United States Military Academy; M.S.E.E., Georgia Institute of Technology
MAJ. THOMAS E. OLSON, B.S., United States Military Academy; M.S.E., Purdue University
MAJ. G. SIDNEY SMITH, JR., B.S., United States Military Academy; M.S.E., Purdue University
MAJ. RONALD F. TRAUNER, B.S., United States Military Academy; M.S.E., Purdue University

Instructors

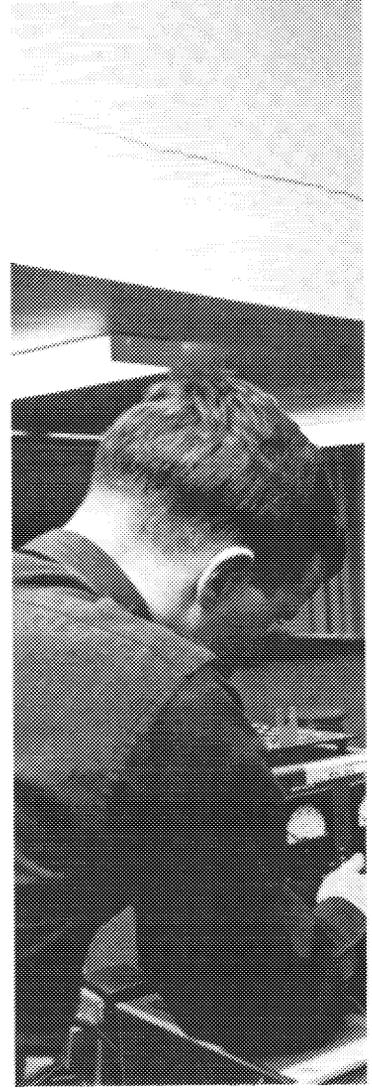
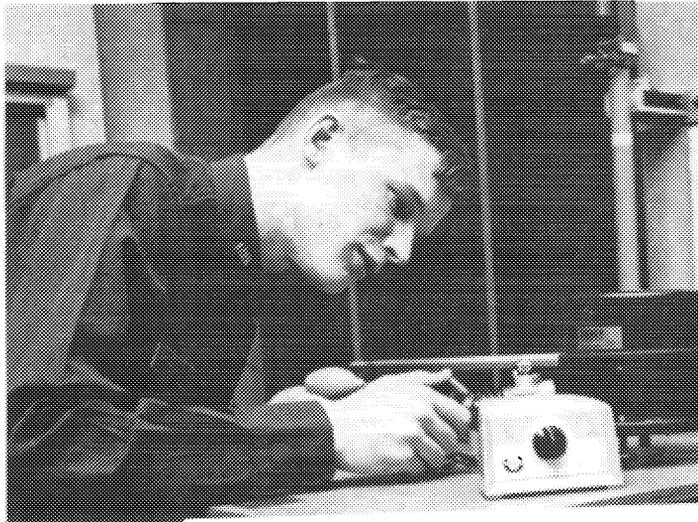
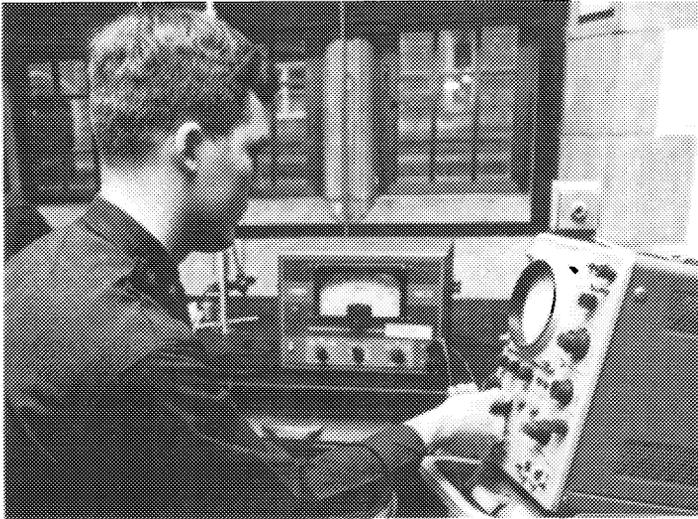
- MAJ. GORDON W. ARBOGAST, B.S., United States Military Academy; M.S.E.E., Georgia Institute of Technology
MAJ. ROBERT BRUCE, B.S., United States Military Academy; M.S.E.E., Georgia Institute of Technology
MAJ. GERALD CHAPMAN, JR., B.S., United States Military Academy; M.S.E.E., North Carolina State University
MAJ. WILLIAM J. D'AMBROGIO, B.S., Pratt Institute; M.E.E., Stevens Institute of Technology
MAJ. WILL M. REMINGTON, B.S., United States Military Academy; M.S.E., Purdue University
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.E.E., South Dakota School of Mines and Technology

Standard Courses

EE 301. ELECTRIC CIRCUITS

First Term — Prerequisites: PH 202, MA 205, MA 206 or MA 207

A study of electric circuits to include charge, current, and voltage, Kirchhoff's Laws, complex phasor representation, sources, waveforms, and instruments, power, resistance, resistive networks and theorems, inductance and capacitance, natural and total response, reactance and impedance, and resonance character-



istics. This foundation leads into a detailed study of AC network analysis, coupled circuits, and magnetic circuits and transformers. Extensive laboratory work throughout the course emphasizes the fundamentals studied and provides a practical working knowledge. *4 Credit Hours.*

EE 304. ELECTRONICS

Second Term -- Prerequisite: EL 301

Concepts of electronic systems are analyzed through a study of signal representation, tank circuits, piezoelectric crystals and Butterworth filters, simple telephone systems, diode electronics, linear and nonlinear diode circuits, and triode and transistor electronics, parameters, and graphical analysis. The course progresses into equivalent circuits, amplifiers, coupling, gain, and frequency response, feedback amplifiers, oscillators, and modulation and detection. The course concludes with an examination of radio waves and antennas and use of transmitters and receivers. Extensive use of laboratory work is made throughout the course. *4 Credit Hours.*

EE 401. ELECTRONIC CIRCUITS

First Term — Prerequisite: EL 304

A study of transistor circuits, biasing and stabilization, multielectrode tubes and semiconductors, LaPlace transform, response of amplifiers, coupling, compensation, inductive coupling and tuning, classification of amplifiers, thermal conduction and runaway, complementary symmetry, feedback, oscillators, and switches. Emphasis throughout the course is placed upon design, laboratory construction and testing of practical circuits. *4 Credit Hours.*

EE 402. AUTOMATIC CONTROL SYSTEMS

Second Term — Prerequisite: EL 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 is scheduled throughout the course. *4 Credit Hours.*

Elective Courses

EE 382. ELECTROMECHANICAL ENERGY CONVERSION

Second Term — Prerequisite: EL 301

A study of the basic principles of electromechanical energy conversions 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, constraints for AC and DC machines, the reluctance motor, and the metadyne. The course concludes with a study of feedback control systems and use of the LaPlace transform. Extensive laboratory work demonstrates the fundamental principles throughout the course. *4 Credit Hours.*

EE 383. ELECTROMAGNETIC FIELDS AND ADVANCED CIRCUITS

First Term — Prerequisites: PH 202 and MA 202

A study of static electric and magnetic fields, Maxwell's hypothesis and equations, plane waves, reflection, and refraction, radiation and antennas, and waveguides, ionospheric propagation and radar. Extensive use of vector calculus is made in these studies. The course then pursues signal representation in electrical and electronic systems, LaPlace transforms, singularity functions, superposition and convolution, introduction to Fourier Series and transforms, and frequency analysis and Bode diagrams. Laboratory sessions are scheduled throughout the course work *4 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: EL 304

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

EE 485. COMPUTER ENGINEERING

Second Term — Prerequisite: EE 304

A study of the basic elements (gates) used in all digital computers, design of economical computer components, interconnection of components, sequence of operation, memory elements and patterns, general digital logic design, micro-programming and hardware-software interface, and future trends in concept and implementation. Laboratory exercises at the circuit, basic module, and small computer level are conducted throughout the course. *2.5 Credit Hours.*

EE 486. SOLID-STATE ELECTRONICS

Second Term — Prerequisites: EL 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, highfield effects, 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: EL 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. ROBERT W. SAMZ, B.S., United States Military Academy; M.S.M.E., University of Michigan; Ph.D., Arizona State University

LTC. WILLIAM K. STOCKDALE, B.S., United States Military Academy; M.S., Ph.D., University of Illinois

MAJ. WILLIAM R. SOWERS, B.S., United States Military Academy; M.S.M.E., Georgia Institute of Technology

Assistant Professors

- LTC. WILLIAM F. CARROLL, B.S., United States Military Academy; M.S., Ph.D., University of Illinois
- LTC. RALPH A. LUTHER, B.S., United States Military Academy; M.S., Purdue University
- LTC. JAMES W. PECK, B.S., United States Military Academy; M.S., University of Illinois
- LTC. DAVID E. WHEELER, B.S., United States Military Academy; M.S., Massachusetts Institute of Technology
- MAJ. CHARLES M. ADAMS, B.A., Pomona College; M.A., University of Alabama
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- MAJ. WILLIAM T. KIRKPATRICK, B.S., United States Military Academy; M.S., University of Illinois
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- MAJ. JOSEPH A. PETROLINO, JR., B.S., United States Military Academy; M.S., Purdue University
- MAJ. RICHARD A. ROTHBLUM, B.S., United States Military Academy; M.S., Princeton University
- MAJ. JOSEPH M. SALVITTI, B.A., Washington and Jefferson College; M.S., Georgia Institute of Technology
- MAJ. MICHAEL L. SHEPPECK, B.S., United States Naval Academy; M.S.E., Purdue University
- MAJ. ALLEN D. SMITH, B.S.C.E., University of Kansas; M.A.E., Texas A&M College
- MAJ. RAY L. TILGHMAN, B.S., United States Military Academy; M.S.M.E., University of Pittsburgh

Instructors

- LTC. ROBERT K. TENER, B.S., United States Military Academy; M.S., Ph.D., Iowa State University
- 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. DELMAR 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

CPT. WILLIAM J. MILLER, B.S., United States Military Academy; M.S.,
University of Southern California

Standard Courses

CE 401. STRUCTURAL ANALYSIS

First Term — Prerequisite: ME 303 or ME 353

A study of the analysis of stresses in statically determinate and indeterminate structures. The course treats the determination of reactions, shear, moment, axial stresses, and live load placement through the use of influence lines. Stresses are analyzed in conventional and special trusses, continuous beams, basic structural frames, long span structures, space frames and cables. Statically indeterminate structures are analyzed by approximate and analytical methods including moment-area theorems, slope deflection, moment distribution, and methods derived from the Law of Conservation of Energy. Throughout the course, development of an understanding of the engineering philosophy and the decision-making process is emphasized. *4 Credit Hours.*

CE 402. STRUCTURAL DESIGN

Second Term — Prerequisite: CE 401

A study of the basic theory as well as the practical aspects of engineering design and an introduction to systems engineering as it applies to the design process. The course emphasizes structural steel design to include beams, columns, beam-columns, tension members, and structural connections. Timber design of structural 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 design parameters to the detailed design of structural members. This problem requires creative thought as well as application of the principles of analysis, design and systems engineering studied previously. Entire course emphasizes engineering philosophy and the process of decision making. *4 Credit Hours.*

GE 401–402. GENERAL ENGINEERING

Prerequisites: None

This course is designed to develop in the cadet 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 systems engineering; emphasizing the study of ballistic and rocket systems; civil engineering systems, which incorporate a study of structural analysis and the design of steel structures; an engineering design problem; and a short, elective subcourse. The engineering design problem is a comprehensive project which emphasizes the application of the design process and some of the optimization techniques in the solution of a total engineering system. Electives are tailored to the interest of the cadets. Electives offered are concrete design, timber design, automotive fundamentals, and principles of small arms. *8 Credit Hours.*

OE 401–402. WEAPON SYSTEMS ENGINEERING

Prerequisites: ME 301 and ME 303

This course is designed to give the cadet experience in the application of previously studied scientific and engineering principles to weapon systems. Coverage is given to sources of energy, electronic computers, weapon system components, trajectories, flight stabilization, servomechanisms, guidance, fuzes, terminal bal-

listic effects, rockets, gas turbines, spark and compression ignition engines, power transmission, engineering materials, terramechanics, and concepts of systems engineering. A Weapon System Design Study includes the development of parameters for and the analysis and design of a proposed new Army weapon system. Integrated laboratory exercises are included. *8 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 problems. *4 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 12 most 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 cover the following additional material: a laboratory investigation of concrete material behavior, the morphology of design, probability approach to safety factors, optimization techniques in design, and an individual analytic and/or laboratory project selected by the cadet. *4 Credit Hours.*

CE 453-454. INTRODUCTION TO NUCLEAR ENGINEERING

Prerequisites: EL 301-304, ME 301-302, PH 303, 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 and 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 first-hand experience in creative engineering as well as insight into the difficulties in designing an optimum system. *8 Credit Hours.*

OE 451-452. HONORS COURSE IN WEAPON SYSTEMS ENGINEERING

Prerequisites: Standing in top 10% of class. Permission of the Head of Department.

The Honors Course for exceptionally capable cadets includes all topics listed for the standard course (OE 401–402). The cadet accelerates this study at a pace governed by his own individual capability. 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 of cadet choice or an individual analytical and/or laboratory project, where approved. *8 Credit Hours.*

Elective Courses

CE 381. SOIL MECHANICS

Both Terms — 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, and stabilization, stress distribution, consolidation, shear strength, and bearing capacity are studied. This knowledge, coupled with the principles of engineering mechanics and mathematics, is applied to attacking and solving practical problems in settlement prediction, calculation of seepage, stability of earth dams and embankments, design of footings and pile foundations, retaining walls, and soil stabilization. Basic laboratory work on Atterberg limits, compaction, unconfined compression, flow nets and other tests is included. *2.5 Credit Hours.*

CE 481. DESIGN OF CONCRETE STRUCTURES

Both Terms — 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 484. 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. Elastic theory methods include direct integration, virtual work, Castigliano's Theorem, and the method of Least Work. 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 484. INDIVIDUAL ENGINEERING PROJECTS

Either Term — Prerequisites: CE 401, CE 451, or CE 453

A course designed to permit the cadet to concentrate upon an area of particular individual interest dealing with a specialized topic in military or civil engineering, either within or outside the scope of the standard course (CE 401—402). The course is conducted on a small group or individual basis and consists of field trips, laboratory and classroom work, and group discussion. The exact scope of the course of study will be established after consultation between the cadet and the Course Director. The course requires the cadet to define and analyze the problem and its parameters; to study the fundamentals involved; to organize his plan of attack; to determine his laboratory procedure if laboratory work is involved; and to achieve a solution. *2.5 Credit Hours.*

GE 381. SCIENTIFIC MANAGEMENT

Prerequisite: MA 202 (Class of 1972 only)

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. There are five major sections to the course. Part I provides an understanding of the management concept and of the application of the scientific method in management. Part II presents the concepts involved in the broad management functions of organization, planning and control. A humanistic approach is taken here, with those psychological and sociological factors bearing on the above functions assuming major importance. Part III explains the use of analytical methods to assist the manager in making decisions in the fulfillment of his several functions. Some of the methods covered are managerial accounting, linear programming, decision theory, simulation, and statistical analysis with its applications in forecasting and validity. Part IV develops an understanding of the field of information processing to include the concepts and tools for understanding how complex information systems can be analyzed and how the source, uses, and requirements for information are identified. Part V provides an opportunity to apply knowledge and skills developed previously in the course by active participation in practical exercise. Included in this exercise will be situations where the quantitative tools must be supplemented by subjective factors considerations. *2.5 Credit Hours.*

GE 383. SYSTEMS ENGINEERING AND DECISION MAKING

Prerequisite: First or Second Class Standing

This course is designed to develop a basic understanding of and an ability to apply the systems attitude and approach in solving large and complex problems such as the cadet will encounter in future military service. The course includes a study of the generalized concepts of systems engineering and decision making. Attention will focus on the universality of their application to all situations, including the non-engineering situation, and especially to the decision making required of the Army officer as a commander and as a manager. It will emphasize the systems engineering approach including the consideration of all factors that bear on the problem such as economic, social, psychological, financial, scientific and ethical, in determining the optimum decision. Methods for considering the non-quantifiable factors and the construction of the model will be studied. Use of the analytic tools such as operations research, systems analysis, and opti-

mization techniques will be shown, but primary emphasis will be on the proper integration of the quantitative and qualitative approaches required in decision making. Laboratory periods and specific projects will provide practical experience. *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. Emphasis is on problem solving from the systems viewpoint. The concepts and techniques developed include: schematic models, decision theory, statistical control, linear programming, inventory control, Monte Carlo simulation, queueing theory, CPM and PERT. The course is pragmatic rather than rigorous and stresses methods currently used to manage military, government 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 trouble-shooting 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 investigated. The course is concluded by predicting vehicle performance based upon its design. Also included are details of unconventional propulsion systems under development and a discussion of passenger cars for greater occupant safety. *2.5 Credit Hours.*

OE 482. INDIVIDUAL ORDNANCE PROJECT

Either Term — Prerequisite: Permission of Head of Department.

The objective of the course is to permit advanced or specialized study of scientific principles as applied in the field of Ordnance Engineering. Study may include either or both theoretical or laboratory effort based upon a sound preparatory investigation in mathematics and/or the basic sciences. Conduct of course will be on an individual or small group basis. Exact scope of study to be established by consultation between the cadet and the Course Director. All material results, whether in the form of hardware or written reports, become the property of the Engineering Department. *2.5 Credit Hours.*

OE 483. ENGINEERING MATERIALS

Either Term — Prerequisites: CH 201–202, PH 201–202

This course provides an introduction to the properties and behavior of solid materials used in engineering applications. The course focuses attention on the microscopic properties of materials which are directly related to the structures found within the materials. Emphasis is placed on the principles that give an engineer a logical basis for understanding the properties, behavior and application of a wide variety of materials. Course coverage includes crystal and molecular structures, structural imperfections, deformation and failure of materials, modification of materials to enhance properties, stability of materials in service. Integrated laboratory experiments analyze the internal structures that determine material properties. One field trip is scheduled during the term. *2.5 Credit Hours.*

OE 487. OPERATIONS RESEARCH

Either Term -- Prerequisites: MA 202, upper half of mathematics class, or permission of Head of Department.

The Operations Research course develops in considerable depth those quantitative methods which are now well-established and routinely used to analyze and solve 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 decision-making process and a review of probability and statistics. After the introductory phase, the following topics are covered: (1) Sampling Theory, (2) Curve Fitting, (3) Monte Carlo Methods, (4) Inventory Theory, (5) Replacement Theory, (6) Reliability Theory, (7) Maintainability Theory, (8) Queueing Theory, (9) Competitive Strategies, (10) Allocation of Resources, (11) Dynamic Programming, and (12) Markov Chains. Emphasis is placed on problem identification, word-to-mathematical model transformations, seeking optimum analytical solutions of these models, and verification of solutions. *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

LTC. HARRY E. CARTLAND, B.G.E., University of Omaha; M.A., Middlebury College

LTC. JOHN F. HOOK, B.S., United States Military Academy; M.A., Middlebury College

LTC. JAMES R. ROSS, B.A., University of California, Berkeley; M.A., Seton Hall University

Assistant Professors

LTC. JOHN H. FARRAR, B.S., United States Military Academy; M.A., American University

LTC. EDWARD F. GRUBBS, JR., B.S., United States Military Academy

LTC. JOHN S. KARK, B.S., M.A., University of Maryland

LTC. PAUL F. PARKS, B.S., United States Military Academy; M.A., Middlebury College

LTC. GRAYSON C. WOODBURY, B.S., United States Military Academy; M.A., Middlebury College

MAJ. ALAN P. ARMSTRONG, B.S., United States Military Academy; M.A., Middlebury College

MR. JASON CHANG, B.A., National South West Associated University (Kunming, China); M.A., New York University

MAJ. JOHN CHILD, B.E., Yale University; M.A., American University

MAJ. WILLIAM A. EDWARDS, B.S., United States Military Academy; 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. WAYNE G. GILLESPIE, B.S., United States Military Academy; M.A., Middlebury College

MAJ. RONALD A. HOFMANN, B.A., University of Maryland; M.A., University of Kentucky

MAJ. JOHN E. KEPLER, B.A., Davidson College

MAJ. JOSEPH C. LUCAS, B.S., United States Military Academy; M.A., Middlebury College

MAJ. JOHN R. McCORMICK, B.S., United States Military Academy

MAJ. JOHN R. McNEALY, A.B., Boston College; A.M., Indiana University

MAJ. RICHARD H. MORTON, B.S., United States Military Academy

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

MAJ. JACK C. SMITH, B.S., United States Military Academy; M.A., Middlebury College

MAJ. SAVA M. STEPANOVITCH, B.S., Ecole de Saint-Cyr

MAJ. SAMUEL D. WILDER, JR., B.S., United States Military Academy; M.A., Middlebury College

MR. CLAUDE VIOLI.ET, B.A., University of Paris (Sorbonne); M.A., Middlebury College

Instructors

LTC. JAMES C. BOWDEN, B.S., University of South Dakota; M.A., American University

LTC. GENE N. CHOMKO, B.S., University of Maryland

LTC. HANS GIERSHIK, B.A., University of Frankfurt, Germany

LTC. ENRIQUE KORTRIGHT, B.S., Heroico Colegio Militar, Mexico

LTC. HUGO F. MOTTA, B.S., Academia Militar das Agulhas Negras

LTC. FRANK H. SMITH, JR., B.A., Northwestern University; M.A., Columbia University

MAJ. RICHARD O. CULLUM, B.S., United States Military Academy; M.A., Vanderbilt University

MAJ. GRINDLEY C. CURREN, B.S., United States Military Academy

MAJ. WILLIAM F. DAUGHERTY, B.S., United States Military Academy; M.A., Middlebury College

MAJ. ROBERT L. DOHERTY, B.A., Northwestern University; B.A., University of Maryland

MAJ. ARTHUR T. FINTEL, B.S., United States Military Academy; M.A., Middlebury College

MAJ. FRED A. GORDEN, B.S., United States Military Academy; M.A., Middlebury College

MAJ. DONALD D. INGRAM, B.S., United States Military Academy

MAJ. ROBERT J. KEE, B.S., United States Military Academy; M.A., Middlebury College

MAJ. GEORGE W. KIRSCHENBAUER, B.S., United States Military Academy; M.A., Middlebury College

MAJ. ARTHUR A. LOVGREN, B.S., United States Military Academy; M.A., Middlebury College

MAJ. JAMES F. McKAY, B.S., United States Military Academy

MAJ. DONN G. MILLER, B.S., United States Military Academy; M.A., University of Pennsylvania

MAJ. KENNETH G. NORMAN, B.S., United States Military Academy; M.A., Middlebury College
 MAJ. HOWARD T. PRINCE II, B.S., United States Military Academy; M.A., American University
 MAJ. DANIEL A. SMITH, B.S., United States Military Academy; M.A., Middlebury College
 MAJ. WIROSLAW J. SNIHUROWYCH, B.A., St. Basil's College; M.A., Fordham University
 MAJ. ROBERT Y. WONG, B.S., United States Military Academy; M.A., Indiana State University
 CPT. JOHN T. BOOKER, B.A., Dartmouth College; M.A., University of Minnesota
 CPT. RICHARD J. CONOBOY, B.A., John Carroll University
 CPT. ALDEN M. CUNNINGHAM, B.S., United States Military Academy
 CPT. WILL E. DEMARET, B.S., United States Military Academy
 CPT. JOHN H. GROSSHANS, B.A., Eastern Washington College; M.A., Middlebury College
 CPT. WALTER E. KATUZNY, B.S., United States Military Academy
 1ST LT. JOHANNES W. VAZULIK, A.B., University of Utah; A.M., Ph.D., Case Western Reserve University
 MR. MICHAEL SOLO, B.A., Monmouth College; M.A., Fordham University

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, all 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. Five or six lectures are included on the history and civilization of the people whose language is being studied. All work is conducted in the foreign language. *8 Credit Hours. (4 each term)*

Advanced Courses

**LF 141–142—French; LG 141–142—German; LS 141–142—Spanish;
 LR 141–142—Russian**

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: Proficiency based on oral and written tests administered prior to the beginning of Fourth Class year

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

***LF 241–242–French; LG 241–242–German; LS 241–242–Spanish;
LR 241–242–Russian**

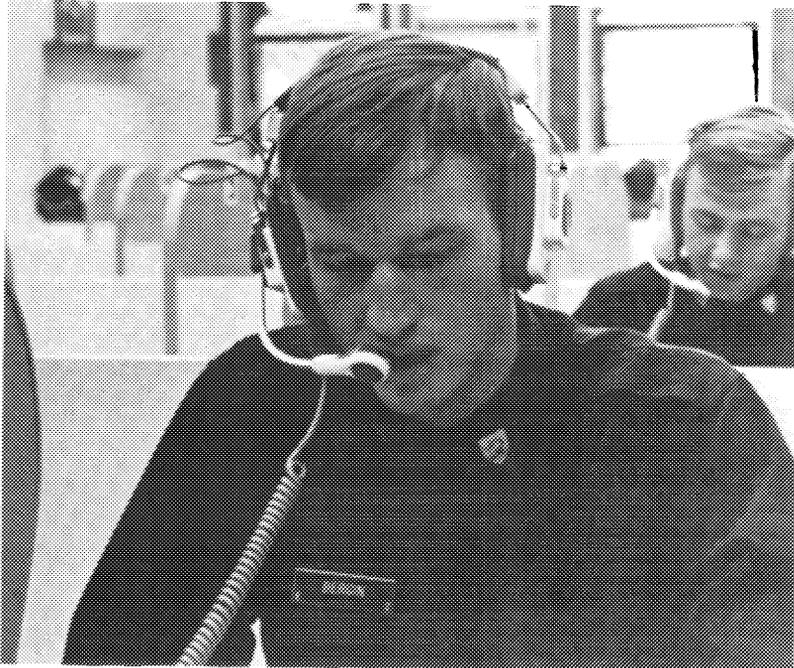
Prerequisites: Completion of the 141–142 courses

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. *8 Credit Hours. (4 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 a series of lectures. Some reading of military writings. All classroom work is in the foreign language. *8 Credit Hours. (4 each term)*



Elective Courses

LF 381. FRENCH LANGUAGE THROUGH LITERATURE (First Term)

LG 381. GERMAN LANGUAGE THROUGH LITERATURE (First Term)

LP 381. PORTUGUESE LANGUAGE THROUGH LITERATURE (First Term)

LR 381. RUSSIAN LANGUAGE THROUGH LITERATURE I (First Term)

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, Russian, Spanish, or South American writers. Class discussions, oral and written compositions, 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, translations into and from the foreign language, interpreter exercises. *2.5 Credit Hours.*

LF 382. MILITARY AND SCIENTIFIC FRENCH (Second Term)

LG 382. MILITARY AND SCIENTIFIC 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 II

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.*

LC 383. CHINESE LITERATURE AND CULTURE I

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 202

Continuation of LC 383. *2.5 Credit Hours.*

LC 481. READINGS ON CHINESE CULTURE

Second Term — Prerequisites: LC 382

Readings on Chinese Culture. Class discussions, oral and written work in Chinese. *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 381–382 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 is an integrated study of the geography, history, and culture 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 will be placed on the German contributions to Western Civilization. "History of German Civilization" will be a comprehensive survey. 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 will be 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 483. 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.*

LR 484. RUSSIAN CIVILIZATION

Second 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.*

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 202

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.*

LR 485. SOVIET RUSSIAN LITERATURE

First Term — Prerequisite: LR 382 or LR 484

A course on the literature of Soviet Russia. Class discussions, talks, outside reading in Russian. *2.5 Credit Hours.*

LF 486. MODERN FRENCH LITERATURE

LG 486. MODERN GERMAN LITERATURE

LS 486. MODERN SPANISH LITERATURE

Second Term — Prerequisites: LG 251–252 or LG 381–382 or LG 485, LS 485, LS 485, LF 251–252 or LF 381–382

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

First Term — Prerequisites: LP 381–382 or LF 485–486 or LG 485–486

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. Cadets taking these courses will meet individually with the instructor at least once a week *2.5 Credit Hours.*

LP 486. DIRECTED STUDIES IN PORTUGUESE

LF 488. DIRECTED STUDIES IN FRENCH

LG 488. DIRECTED STUDIES IN GERMAN

Second Term — Prerequisites: LF 487 or LP 381–382 or LG 487

Continuation of LP 485, LF 487, LG 487 — Directed Studies in Portuguese, French or German. *2.5 Credit Hours.*

LR 486. SOVIET EXPOSITORY WRITING

Second Term — Prerequisites: LR 483

Advanced studies from current 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

Associate 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

Associate Professors

COL. JAMES L. MORRISON, JR., B.A., Virginia Military Institute; M.A., University of Virginia; Ph.D., Columbia University

LTC. ROBERT L. ACKERSON, B.S., United States Military Academy; M.S., Iowa State University

LTC. JAMES F. RANSONE, JR., B.S., United States Military Academy; M.S.E., Princeton University; M.A.I.A., George Washington University

Assistant Professors

LTC. EDD M. CARTER, A.B., The Citadel; M.A., Texas Western University

LTC. WILLIAM R. CRITES, B.S., United States Military Academy; M.A., Duke University

LTC. DAVID R. METS, USAF, B.S., United States Naval Academy; M.A., Columbia University

LTC. CHARLES E. MILLER, JR., B.S., United States Military Academy; M.A., Duke University

LTC. BRUCE D. SMITH, USAF, B.S., Oregon State; M.S., George Washington University

LTC. VELOY J. VARNER, B.S., United States Military Academy

MAJ. WALTER S. BARGE, B.A., Wake Forest College; M.A., Columbia University

MAJ. RAYMOND E. BELL, JR., B.S., United States Military Academy; M.A., Middlebury College

MAJ. ALBERT S. BRITT, III, B.S., United States Military Academy; M.A., University of California

MAJ. JOSIAH BUNTING, III, B.A., Virginia Military Institute; M.A., Oxford University

MAJ. WALTER S. DILLARD, B.S., United States Military Academy; M.A., University of Washington

MAJ. HENRY E. ERBE, JR., B.A., Middlebury College; M.A., American University

MAJ. JOHN G. LARKINS, B.A., University of Wisconsin; M.A., John Carroll University

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

MAJ. GLENN H. LEHRER, B.S., United States Military Academy; M.S., The Ohio State University

MAJ. JOHN H. MOELLERING, B.S., United States Military Academy; M.S., University of California

MAJ. MOORAD MOORADIAN, Ed.B., Rhode Island College; M.A., University of Rhode Island

MAJ. GERALD P. STADLER, B.S., United States Military Academy; M.A., Duke University

MAJ. WILLIAM A. STOFFT, B.S., South Dakota University; M.A., New York University

CPT. JOSEPH J. ELLIS, III, B.S., College of William and Mary; M.A., Ph.D., Yale University

Instructors

LTC. DOUGLAS M. CRAVER, B.S., Gettysburg College; M.A., Duke University

CDR. JEROME A. O'CONNELL, USN, B.S., United States Naval Academy

MAJ. JOHN H. BRADLEY, B.S., United States Military Academy; M.A., Rice University

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. STEPHEN KLEIN, B.S., United States Military Academy; M.A., Syracuse University

MAJ. ROBERT F. KREIDLER, B.S., John Carroll University; M.A., University of Pittsburgh

MAJ. DON L. LAIR, B.S., United States Military Academy; M.A., Stanford 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. DAVID M. GLANTZ, B.A., Virginia Military Institute; M.A., University of North Carolina

CPT. MICHAEL D. KRAUSE, B.A., Norwich University; M.A., Ph.D., Georgetown University

CPT. ROY L. MAY, B.A., M.A., Texas A.&M. University

CPT. HAROLD W. NELSON, B.S., United States Military Academy; M.A., University of Michigan

CPT. THOMAS W. SWEENEY, B.A., M.A., John Carroll University

CPT. EGON R. TAUSCH, B.A., M.A., University of Texas

1LT. THOMAS J. ARCHDEACON, B.A., Fordham University; M.A., Columbia University

1LT. DAVID L. THAXTON, B.A., Rutgers University; M.A., Indiana University

2LT. JOHN P. ROUSMANIERE, B.A., M.A., Columbia University

Standard Courses

HI 201. HISTORY OF EUROPE 1500-1870

First Term — Prerequisites: None

A survey of the major political, economic, and social developments in the history of Europe since the Renaissance. Events in America and in Asia are studied as they relate to European history. The major writing requirement is geared to

the key problem of the period — The French Revolution. This course provides a foundation for further study of the institutions and issues of modern Western Civilization. *2.5 Credit Hours.*

HI 202. HISTORY OF EUROPE SINCE 1870

Second Term — Prerequisite: HI 201

This course combines a survey of the major developments in the history of Europe since 1870 and, by means of several seminar subcourses, a study in depth of particular nations, periods, or problems selected from the time frame of the course. The central theme is political-sociological, to which economic and intellectual developments are linked. Stress is on the increasing integration of western society, its response to totalitarian pressures, and the influence of the Atlantic nations on the development of the contemporary global environment. *2.5 Credit Hours.*

HI 203. HISTORY OF THE UNITED STATES TO 1877

First Term — Prerequisites: None

A survey of the major developments in the history of the United States from the colonial period to the end of Reconstruction. Particular emphasis is given to the colonial experience and the development of a distinctive American consciousness, comparative studies of slavery, and the impact of the Civil War. The course focuses on political history and how the political structure is linked to economic, intellectual and social developments. *2.5 Credit Hours.*

HI 204. HISTORY OF THE UNITED STATES SINCE 1877

Second Term — Prerequisite: HI 203

A survey of the major trends in the history of the United States since Reconstruction. While social, economic and political developments are emphasized, particular stress is laid upon the growth of the American tradition of protest and reform, social and economic readjustments, and America's rise to a position as a world power. The course includes a seminar to allow a study in depth of a particular historical problem. *2.5 Credit Hours.*

HI 401–402. HISTORY OF THE MILITARY ART

Prerequisites: HI 201-202 or HI 203-204

A study of man in his role as a warrior that also traces the evolution of the art of war. Beginning with the campaigns of Alexander of Macedon, the subject is developed historically by tracing threads of continuity. These threads emphasize the theory and doctrine of warfare, strategy and tactics, generalship, military professionalism, logistics, and administration, technology, and the interrelationships between warfare and social, political, and economic factors. Sea power and — as the course proceeds into the 20th century — air power, are correlated with land power. The principles of joint and combined command are included as the course moves to conclusion with consideration of the post-World War II period: the Korean War, revolutionary warfare and the Arab-Israeli Wars. *8 Credit Hours.*

Elective Courses

HI 371. HISTORY OF RUSSIA

Either Term — Prerequisites: HI 201–202 or HI 203–204 (May be taken concurrently)

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-1880 period, utilizing a 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 (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 381. REVOLUTIONARY WARFARE

Either Term — Prerequisites: HI 201–202 or HI 203–204 (May be taken concurrently)

A study of the history of revolutionary warfare from its ancient origin to its modern intensity. The cadet analyzes case studies of revolutionary warfare in chronological order, thereby gaining both a depth of knowledge of this type of conflict and an ability to analyze current and future revolutionary situations. The course includes a survey of outstanding revolutionary theorists. Emphasis is placed on the waging and countering of revolutionary warfare since World War II. *2.5 Credit Hours.*

HI 382. EVOLUTION OF MODERN WARFARE, 1500-1900

Either Term — Prerequisites: HI 201–202 or HI 203–204 (May be taken concurrently)

This course traces the evolving pattern of war — and the art of waging it — during the four centuries from the end of the Medieval Age to the threshold of the twentieth century. It includes a study of the impact on warfare caused by societal changes, military philosophies, and the industrial revolution. Supplementing the material presented in the History of the Military Art course (HI 401), this elective probes more deeply into the development of weapons, tactics, strategy, and generalship in the formative years of modern warfare. The genesis of an American Regular Army is an implicit portion of the course. A survey of the development of naval warfare is also included. *2.5 Credit Hours.*

HI 383. TWENTIETH CENTURY WARFARE

Either Term — Prerequisites: HI 201–202 or HI 203–204 (May be taken concurrently)

The purpose of this course is to investigate Warfare in the Twentieth Century. The course is divided into three subcourses: (1) World Ground Military Systems, in which the military structures of Germany, France, the United States, Russian, and Japan are studied; (2) Strategy and Tactics, in which ground, sea, and air war in World War I is examined, the reaction to this war by theorists and soldiers is investigated, and the results of these reactions are related to World War II; (3) The Age of the Atom, in which the current roles of the Army, Navy, and Air Force, and the concepts of nuclear and limited warfare of Russia and the United States are included. *2.5 Credit Hours.*

HI 481. SEMINAR IN HISTORY

Either Term — Prerequisites: HI 201–202 or HI 203–204; permission of instructor.

A study of theories and methods used in historical analysis of man's developing institutions and ideas. The cadet reads representative works of eminent historians, studying their use of sources, interpretive philosophies, and styles. He applies these ideas in an investigation of a selected historical period or problem. Seminar topics in 1970-71 are The Negro in American History and Great Western Historians. *2.5 Credit Hours.*

HI 489. INDIVIDUAL HISTORY PROJECT

Either Term — Prerequisites: HI 401-402 (may be taken concurrently) and departmental approval

An individual research project, this course affords the cadet the opportunity to select a history topic in consultation with his faculty advisor and proceed independently with research and writing. The cadet and faculty advisor meet during the term as often as either feels is necessary. At the end of the term, the cadet is examined orally on his completed research paper by a faculty committee. *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

Associate Professor

COL. THOMAS C. OLDHAM, J.D., University of Miami; LL.M., New York University

Assistant Professors

MAJ. HENRY H. H. CLARKE, B.A., Virginia Military Institute; LL.B., University of Virginia

MAJ. DAVID T. GRAY, B.S., United States Military Academy; J.D., Georgetown University

CPT. JOHN K. MCGUIRK, B.A., Manhattan College; J.D., Boston College

CPT. THOMAS W. MORRISS, B.A., Yale University; LL.B., Harvard University

CPT. PLACIDO F. PAPPALARDO, B.A., Middlebury College; LL.B., State University of New York (Buffalo)

CPT. JAMES H. WATZ, B.S., Canisius College; LL.B., Boston College

Instructors

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

CPT. JAMES M. BAUSCH, B.S., Creighton University; J.D., Creighton University

CPT. WILLIAM F. BELCHER, B.A., University of Southern Florida; J.D., Stetson Law School

CPT. JOEL W. COLLINS, JR., B.A., Clemson University; J.D., University of South Carolina

CPT. JOHN D. CONDERMAN, B.S., 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. JOSEPH M. GRINES, B.S., Drexel Institute; J.D., Temple University

CPT. MICHAEL R. MAGASIN, B.A., University of California; J.D., University of California

CPT. FRANCIS O'BRIEN, A.B., Yale University; J.D., Boston College

CPT. THOMAS F. MITCHELL, B.A., Stanford University; LL.B., University of Virginia

CPT. WILLIAM B. WOODWARD, B.A., Florence State College; LL.B., Cumberland School of Law

Standard Courses

LW 301. BASIC PRINCIPLES AND LEGAL METHODS

First Term — Prerequisites: None

The Legal Philosophy and Basic Principles of Law segment of the course covers the principal theories of law which have been set forth by prominent legal philosophers of Western Civilization and provides an introduction to the nature and application of law and the functions of some of the traditional legal subjects including contracts, torts, and property.

The Legal Methods of Proof portion of the course provides an introduction to the Anglo-American rules of proof and their logical basis with particular emphasis on developing a logical and rational reasoning ability in both legal and non-legal areas. *2.5 Credit Hours.*

LW 302. CONSTITUTIONAL LAW AND MILITARY LAW

Second Term

Constitutional Law provides an examination of the constitutional concept of the United States government including legislative, judicial, and executive pow-

ers and limitations, individual rights under the Constitution, the defense establishment, constitutional powers with respect to International Law, Law of War, and the legal aspects of civil affairs and counterinsurgency.

The portion of the course on Military Law provides a study of punishments, the component parts of crimes and offenses, criminal responsibility, selected articles of the UCMJ, jurisdiction, pretrial matters, nonjudicial punishment and courts-martial procedures. Basic theories and practical procedures are joined to enhance the cadet's ability to discharge his future responsibilities in military law. *2.5 Credit Hours.*

Elective Courses

LW 481. INTERNATIONAL LAW

Either Term — Prerequisites: LW 301–302

An introduction to International Law, including a discussion of the nature and sources of International Law, problems of nationality, recognition of states, jurisdiction of states, international agreements and diplomatic intercourse, and the law 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 is comprised of three parts. The first part consists of class analysis of selected case studies involving significant modern international law episodes, such as the Berlin blockade and the Cuban missile crisis. The second and major part of the course presents class teams with hypothetical problems involving international confrontations on land, sea and air. These problems require research, formulation and presentation of solutions applying international law norms. The third part of the course requires individual research 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. WARREN H. KARSTEDT, B.A., Ripon College; M.S., Purdue University; Armed Forces Staff College; Industrial College of the Armed Forces

COL. THOMAS E. ROGERS, B.S., United States Military Academy; B.S., M.A., University of Alabama; Army War College

LTC. 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

LTC. THEODORE C. BIELICKI, B.S., United States Military Academy; M.S., United States Naval Postgraduate School; Armed Forces Staff College

Assistant Professors

- LTC. ROGER R. REDHAIR, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- MAJ. DANIEL G. BARNEY, B.S., United States Military Academy; M.S., University of Illinois
- MAJ. ANDREW P. BLASCO, B.S., Loyola College; M.S., Ohio State University
- MAJ. GEORGE W. BOWERS, B.S., Indiana State University; M.S., Rensselaer Polytechnic Institute
- MAJ. WILLARD C. CONLEY, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- MAJ. JAMES I. CROWTHER, JR., B.S., United States Military Academy; M.S., Air Force Institute of Technology
- MAJ. MICHAEL J. DWYER, JR., B.S., United States Naval Academy; M.S.E., University of Michigan
- MAJ. ROSS A. GAGLIANO, B.S., United States Military Academy; M.S., United States Naval Postgraduate School
- MAJ. RICHARD E. GARVEY, JR., B.S., United States Military Academy; M.S., United States Naval Postgraduate School
- MAJ. WILLIAM J. GREIF, B.S., University of Detroit; M.S., Michigan State University
- MAJ. FRED N. HALLEY, B.S., United States Military Academy; M.S., University of Virginia
- MAJ. RUSSELL J. HESCH, A.B., Central Michigan University; M.S., University of Missouri
- MAJ. EDWARD E. HILDRETH, JR., B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- MAJ. WILLIAM KAHN, B.S., Michigan Technological University; M.S., Ohio State University
- MAJ. WILLIAM G. KOSCO, B.S., United States Military Academy; M.S., University of Illinois
- MAJ. EDGAR D. MADDOX, B.S., Murray University; M.S., University of Kansas
- MAJ. ROBERT A. McDONALD, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- MAJ. ROYCE D. MILLER, B.S., South Dakota School of M&T; M.S., United States Naval Postgraduate School
- MAJ. JAMES E. REYNOLDS, B.S., M.S., University of Oregon
- MAJ. RICHARD C. SADLER, SR., B.S., Oregon State University; M.S., University of Arizona
- MAJ. DAVID E. SCHORR, B.S., United States Military Academy; M.S., Tulane University
- MAJ. JONATHAN W. SEARLES, B.S., United States Military Academy
- MAJ. ANDREW B. SEIDEL; B.S., United States Military Academy; M.S., University of Illinois
- MAJ. WILLIAM E. SELTZ, B.S., United States Military Academy; M.S., University of Illinois
- MAJ. DAVID R. SPANGLER, B.S., United States Military Academy; M.S., University of Illinois
- MAJ. CHARLES W. TINNEMEYER, B.S., United States Military Academy; M.E., Texas A&M University

MAJ. PAUL A. WILBUR, B.S., M.S., University of Texas
CPT. ROY C. BUCKNER, B.S., United States Military Academy; M.C.E., Rensselaer Polytechnic Institute
CPT. LEONARD C. GREGOR, B.S., United States Military Academy; M.S., Purdue University

Instructors

MAJ. JAMES S. ARMSTRONG, JR., B.S., United States Military Academy; M.S., University of Arizona
MAJ. THOMAS R. BAXTER, B.S., Auburn University; M.S., Stanford University
MAJ. DENNIS L. BENCHOFF, B.S., United States Military Academy; M.S., Michigan State University
MAJ. LYNN A. BENDER, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
MAJ. FRANK T. BLANDA, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
MAJ. QUINTON P. BOYD, B.S., Davidson College; M.S., Purdue University
MAJ. ROGER A. BROWN, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
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. JAMES C. CONNOLLY, II, B.S., United States Military Academy; M.S., Arizona State University
MAJ. ARTHUR N. CROWELL, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
MAJ. BERT H. CUSTER, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
MAJ. GEORGE R. DUNCAN, B.S., United States Military Academy; M.S., Stanford University
MAJ. FRANCIS W. FARRELL, JR., B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
MAJ. GEORGE L. GUNDERMAN, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
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. NORMAN E. JAROCK, B.S., St. Norbert College; M.S., Rensselaer Polytechnic Institute
MAJ. JAMES L. KAYS, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
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. JAMES W. McNULTY, B.S., United States Military Academy; M.S., Ph.D., University of Illinois

- MAJ. ALLEN Z. MILLER, B.S., United States Military Academy; M.S., Stanford University
- MAJ. CHARLES H. PERRINE, B.A., Bowdoin College; M.A., Pennsylvania State University
- MAJ. DAVID J. PHILLIPS, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- 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. JOHN K. SOLOMON, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- MAJ. GLEN J. THORSON, B.S., University of Illinois; M.S., Rensselaer Polytechnic Institute
- MAJ. LAWRENCE E. WELSH, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- MAJ. ERNEST G. ZENKER, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- CPT. GARY Q. COE, 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. ALBERT J. GENETTI, B.S., United States Military Academy; M.S., University of Illinois
- CPT. RONALD W. LIND, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute
- CPT. DALE F. MEANS, B.S., United States Military Academy; M.S., Arizona State University
- CPT. WILLIAM J. REYNOLDS, B.S., United States Military Academy; M.C.E., Rensselaer Polytechnic Institute

Successful completion of the standard program by the end of the second year satisfies the requirement in mathematics for graduation from the Military Academy. Cadets who are permitted to concentrate their elective courses in the National Security and Public Affairs or Humanities (NSPA/HUM) area may take an elective or an upperclass core course in lieu of MA 206. The three advanced programs are designed for cadets who, by virtue of 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. The courses constituting the standard and advanced programs are shown below.

STANDARD PROGRAM

First year, MA 101–106; second year, MA 205–206. *23 Credit Hours.*

STANDARD PROGRAM: (NSPA/HUM)

First year, MA 101–106; second year, MA 207. *19 Credit Hours.*

ADVANCED PROGRAM I

First year, MA 101–152; second year, MA 281°–202. *23 Credit Hours.*

ADVANCED PROGRAM II

First year, MA 153–154; second year, MA 281°–202. *23 Credit Hours.*

ADVANCED PROGRAM III

First year, MA 155–156; second year, MA 285°–286°. *23 Credit Hours.*

*Electives during the second year need not be in mathematics; but if mathematics is chosen, the appropriate courses are those shown.

The subject-matter content of the separate courses is described in the outlines to follow.

Standard Courses

MA 101. CALCULUS AND ANALYSIS

Prerequisites: None

This is the 1st term of a two-term, beginning course in calculus and analytic geometry. During this first term, vector analytic geometry in two dimensions is covered in coordination with differential calculus. A brief introduction to foundations of the real number system and some numerical methods suitable to digital computer solutions are included in addition to the usual study of derivatives and differentials of algebraic and transcendental functions, with applications. *7.5 Credit Hours.*

MA 106. CALCULUS AND ANALYSIS

Prerequisite: MA 101

This is the second term course in the Standard Program. It concludes the study of analytic geometry and differential calculus begun in MA 101 in the first term. The course then continues with integral calculus to include applications to geometric and physical problems, multiple integrals, infinite series and expansion of functions. *7.5 Credit Hours.*

MA 202. DIFFERENTIAL EQUATIONS, AND PROBABILITY THEORY AND STATISTICAL INFERENCE

Prerequisite: MA 281

This course includes the last half of work in differential equations begun in the first term and is immediately followed by probability theory and statistical inference which emphasizes calculus as a prerequisite. Included are fundamentals of probability theory and mathematical models to include random variables, probability distributions and measurements of these distributions, probability, and density functions; binomial and normal distributions; use of de Moivre's theorem, the Central Limit theorem, and the Student-t, Chi-Square and Poisson distributions; basic statistical inference including sampling distributions, theory of estimation, hypothesis testing; correlation; and applications of these techniques to practical problems. *4 Credit Hours.*

MA 205. DIFFERENTIAL EQUATIONS AND PROBABILITY THEORY AND STATISTICAL INFERENCE

Prerequisite: MA 106

This course includes a basic course in differential equations and is immediately followed by probability theory and statistical inference course which is continued in the second term. The probability and statistics course includes fundamentals of probability theory, random variables, probability distributions and probability and density function, binomial and normal distributions, the Central Limit theorem, the Chi-square, t, and Poisson distributions, sampling distributions, theory of estimation and confidence intervals for variance. *4 Credit Hours.*

MA 206. PROBABILITY THEORY AND STATISTICAL INFERENCE AND LINEAR ALGEBRA AND LINEAR PROGRAMMING

Prerequisite: MA 205

This course includes the last part of Probability Theory and Statistical Inference to include hypothesis testing and analysis of variance, followed by linear algebra and linear programming. The work in linear algebra includes a study of



matrices, systems of linear equations, vector spaces, and characteristic value (eigenvalue) problems, as well as an introduction to linear programming. *4 Credit Hours.*

MA 207. DIFFERENTIAL EQUATIONS AND PROBABILITY THEORY AND STATISTICAL INFERENCE

Prerequisite: MA 106

This course includes a basic differential course in differential equations followed by a course in probability theory and statistical inference. The probability and statistics course includes fundamentals of probability theory, random variables, probability distributions and probability and density functions; binomial and normal distributions, the Central Limit theorem, the Chi-square, t, and Poisson distributions, sampling distributions, theory of estimation confidence intervals, hypothesis testing and analysis of variance. *4 Credit Hours.*

Open to cadets who concentrate their elective courses in NSPA/HUM area.

Advanced Courses

MA 152. ADVANCED PLACEMENT CALCULUS, ANALYSIS, AND LINEAR ALGEBRA

Prerequisites: MA 101 and selection by Head of Department

This course is given in the second term of the first year to selected cadets who complete MA 101 with high standing and thereby become eligible for Advanced Program I. The calculus coverage is the same as in MA 106. MA 152 also includes a course in linear algebra which is at a higher level than the linear algebra offered to cadets enrolled in the Standard Program during their 3rd Class (sophomore) Year, as part of MA 206, and it includes a study of vector operations, vector spaces, matrices, determinants, linear transformations, systems of linear equations, characteristic values and vectors, and quadratic forms. *7.5 Credit Hours.*

MA 153. ADVANCED PLACEMENT CALCULUS AND ANALYSIS

Prerequisite: Selection by Head of Department

The scope of this course encompasses the subject matter of MA 101 plus a significant part of MA 106. The work concentrates on introductory function theory, a rigorous treatment of differential calculus for functions of a single real variable, and vector analytic geometry in two and three dimensions. *7.5 Credit Hours.*

MA 154. ADVANCED PLACEMENT CALCULUS, LINEAR ALGEBRA AND LINEAR PROGRAMMING

Prerequisite: MA 153

This is the second term course in Advanced Program II and a continuation of MA 153. The calculus coverage in MA 154 encompasses the portion of MA 106 not already covered by MA 153; i.e., a rigorous treatment of integral calculus for functions of a single real variable, multiple integrals, infinite series, and expansion of functions. The work in linear algebra is more extensive than that in MA 152 and includes an introduction to linear programming. *7.5 Credit Hours.*

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, to include an introduction to differential equations. The scope encompasses the subject matter of the entire first year Standard Program calculus and analysis. *7.5 Credit Hours.*

MA 156. ADVANCED PLACEMENT LINEAR ALGEBRA AND LINEAR PROGRAMMING, DIFFERENTIAL EQUATIONS, AND PROBABILITY THEORY AND STATISTICAL INFERENCE

Prerequisite: MA 155

This course includes the work in linear algebra and linear programming, differential equations, probability theory and statistical inference which is ordinarily covered in the second year of the Standard Program. *7.5 Credit Hours.*

Elective Courses

MA 281. VECTOR CALCULUS AND DIFFERENTIAL EQUATIONS

Prerequisite: MA 152 or MA 154

The scope of this course is essentially the same as that covered in MA 483, VECTOR CALCULUS, followed by work in differential equations. Cadets from Advanced Programs I and II who elect MA 281 benefit from this election by earning credit for vector calculus, a key elective prerequisite to a number of mathematics, science and engineering electives. *4 Credit Hours.*

MA 285–286. VECTOR CALCULUS, COMPLEX ANALYSIS, AND DIFFERENTIAL EQUATIONS (Intermediate)

Prerequisite: MA 156

This two-term course 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 complex analysis. Complex analysis is completed in the second term followed by intermediate differential equations. *8 Credit Hours.*

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

MA 481. LINEAR PROGRAMMING

Second Term — Prerequisites: MA 206, MA 152, 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. Practical problems are included, with emphasis on military applications and their solution with aid of the digital computer. *2.5 Credit Hours.*

MA 482. ABSTRACT ALGEBRA

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

This is an introductory course in modern algebra for cadets who plan to take graduate work of a theoretical nature in mathematics, physical science or engineering. A unit on set theory, relations, mappings and elementary number theory precedes a study of semigroups and groups which includes normal subgroups, quotient groups and the fundamental homomorphism theorems. The remainder of the course is devoted to rings, domains and fields. Quotient rings are used to construct the splitting field of a polynomial. *2.5 Credit Hours.*

MA 483. VECTOR CALCULUS

First Term — Prerequisites: MA 106, MA 152, MA 154 or MA 156

This course develops many of the basic mathematical tools used in science and engineering subjects. After a unit on vector algebra and kinematics, 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, surface area formulas and Leibnitz' Rule 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 281 or MA 285.

MA 484. DIFFERENTIAL EQUATIONS (Intermediate)

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

This course is an extension of the concepts developed in MA 205. 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. Sturm-Liouville boundary value problems and Fourier Series are considered and applied to the theory of partial differential equations. Systems of equations are studied with the aid of matrix techniques which develop the eigenvalue problem and diagonalization through the use of similarity transformations. *2.5 Credit Hours.*

Not open to cadets who have completed MA 286.

MA 485. COMPLEX ANALYSIS

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

This course is primarily an introduction to functions of a complex variable, including algebra of a complex variable, elementary function, 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 286.

MA 486. NUMERICAL ANALYSIS WITH DIGITAL COMPUTATION

Second Term — Prerequisites: MA 202, MA 206 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: MA 483 or MA 281 or MA 285 and MA 485 or MA 286. Permission of Head of Department.

Intended for cadets who plan to pursue graduate work of a theoretical nature in mathematics, 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 through

Dedekind cuts, the properties of finite and infinite sets, and the concepts of line topology provide the basis for a more rigorous discussion of the topics of elementary differential calculus — sequences, series, limits, continuity, and differentiability. Sequences and series of functions are studied 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

Associate Professor and Deputy Head of Department

LTC. JOHN D. DAIGH, B.S., United States Military Academy; M.S.C.E., University of Illinois; Ph.D., University of Illinois

Associate Professors

LTC. JAMES K. STROZIER, B.S., United States Military Academy; M.S.E., University of Michigan; Ph.D., University of Michigan

MAJ. ROBERT W. GIULIANO, B.S., United States Military Academy; M.S.E., Princeton University; M.A., Princeton University; Ph.D., Princeton University

MAJ. CHARLES M. RADLER, B.S., United States Military Academy; M.S.C.E., University of Illinois; Ph.D., University of Illinois

Assistant Professors

MAJ. RONALD L. BELLOWS, B.S., United States Military Academy; M.S.N.E., Air Force Institute of Technology

MAJ. JERRY W. BETTS, B.S., United States Military Academy; M.S.M.E., Michigan State University

MAJ. PETER J. BOYLAN, B.S., United States Military Academy; M.S.E., University of Michigan

MAJ. DENIS C. DICE, B.S., United States Military Academy; M.S.M.E., New Mexico State University

MAJ. JAMES W. DUNMYER, B.S., United States Military Academy; M.S.C.E., University of Illinois

MAJ. JOHN H. ELIOT, B.S., United States Military Academy; M.S., Georgia Institute of Technology

MAJ. JAMES S. HARRINGTON, B.S., United States Military Academy; M.S.-M.E., University of Southern California

MAJ. PETER D. HEIMDAHL, B.S., United States Military Academy; M.S., University of Illinois; Ph.D., University of Illinois

MAJ. FRANK J. REDD, B.S., United States Military Academy; M.S., Stanford University; Engineer, Stanford University

MAJ. JAMES B. ROYCE, B.S., United States Military Academy; M.S.C.E., University of Illinois

MAJ. JOSEPH A. SHEA, B.S., United States Military Academy; M.S., Tulane University

- MAJ. DONALD R. STREET, B.S., United States Military Academy; M.S.M.E., California Institute of Technology; Engineer, California Institute of Technology
- MAJ. CHRISTOPHER P. TATE, B.S., United States Military Academy; M.S.-M.E., University of Illinois
- MAJ. DANIEL L. WHITESIDE, B.S., North Carolina State University; M.S., State University of New York at Buffalo
- CPT. GILBERT C. BRUNNHOEFFER, III, B.S., United States Military Academy; M.S.C.E., University of Illinois
- CPT. FRANK CARDILE, B.S., United States Military Academy; M.S., Stanford University
- CPT. EDWARD G. TEZAK, B.S., United States Military Academy; M.S., University of California at Los Angeles

Instructors

- MAJ. HENRY F. FAERY, B.S., United States Military Academy; M.S., Massachusetts Institute of Technology
- MAJ. IGOR D. GERHARDT, B.S., United States Military Academy; M.E., 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., 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., Princeton University
- MAJ. PHILIP A. SYKES, B.S., United States Military Academy; M.S., 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

Standard Courses

ME 301. THERMODYNAMICS

Either Term

This course is a study of energy, energy transfer and the media utilized 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 utilized includes gasoline, diesel and fuel research engines, a steam laboratory demonstration unit, steam turbines, air compressors, gas turbines and refrigeration and air conditioning units. *4 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, turbomachines, and open channel flow concepts. Practical exercises in the laboratory illustrate theory previously studied in the classroom. Equipment used includes pumps, hydraulic turbines, 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. *4 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. *4 Credit Hours.*

Advanced Courses

ME 351. ADVANCED THERMODYNAMICS

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

A more sophisticated coverage of the subject matter of ME 301 with the addition of such material as microscopic concepts, nonreacting 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. *4 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. *4 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, damped and forced vibrations, and a section on dynamics of non-rigid systems which includes variable mass, generalized coordinates, Lagrange's equations and Hamilton's principle. *4 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 materials. Creep, fatigue and brittle fracture are introduced. Six laboratory exercises illustrating the above principles are conducted during the course. *4 Credit Hours.*

ME 481. GAS DYNAMICS

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 through the use of subsonic and supersonic wind tunnels, a water table, and a design problem. *2.5 Credit Hours.*

ME 482. HEAT, MASS AND MOMENTUM TRANSFER

Either Term — Prerequisite: ME 302 or ME 352

This course offers a unified treatment of transfer phenomena, emphasizing the similarities between heat, mass and momentum transfer processes where applicable. Included is a broad treatment of ablation, boiling, condensation, drying of solids, heat exchanger design, and radiation, including turbulent as well as laminar solutions. *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 trajectories, 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 axial forces in curved bars and rings, torsion and bending of beams, bending and buckling of thin plates and shells and inelastic behavior. *2.5 Credit Hours.*

ME 485. CONTINUUM MECHANICS

Either Term -- Prerequisites: ME 301 or ME 351, ME 302 or ME 352, ME 303 or ME 353, MA 483 or Equivalent.

This course forms a foundation for deeper study in special branches such as hydrodynamics, gas dynamics and elasticity. Necessary concepts and theorems of tensor geometry are developed at the start. Study of state of stress, kinematics of instantaneous motion, the fundamental mass, momentum and energy theorems, and constitutive equations form the foundation. Applications to problems with perfect fluids, viscous fluids, and 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. Analysis of continuous systems provides a vehicle for the discussion of differential equations, boundary value problems, and eigenvalue 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 487. 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, and study of aircraft performance, flight stability and helicopter aerodynamics. *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 352, 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 Theoretical and Applied Mechanics, Aerodynamics, or Space Mechanics. 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. JOHN H. VOEGTLY, B.S., University of Pittsburgh; M.D., University of Pittsburgh

Assistant Professors

COL. HOWARD G. ABBOTT, B.A., Syracuse University; M.D., Syracuse College of Medicine

MAJ. PETER D. KAHLER, B.S., Kansas State Teachers College; M.S., Kansas State Teachers College; ED.S., Kansas State Teachers College

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

Associate Professors

COL. LOREN E. RADFORD, B.S., University of Washington; M.S., University of Virginia; Ph.D., University of Virginia

COL. MERLE G. SHEFFIELD, B.S., United States Military Academy; M.S., University of Virginia

LTC. ARTHUR P. DEVERILL, JR., B.S., United States Military Academy; M.S., (NE), University of Virginia

LTC. GEORGE W. B. GLEN, B.S., United States Military Academy; M.S., Stevens Institute of Technology

MAJ. JAMES S. WILLIS, JR., B.S., United States Military Academy; M.S., Ph.D., Rensselaer Polytechnic Institute

Assistant Professors

LTC. JAMES A. CHERNAULT, B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute

MAJ. EDWARD R. BALDWIN, JR., B.S., United States Military Academy; M.S.E.E., University of Arizona

MAJ. JOHN E. CHRISSENGER, B.S., Stanford University; M.S., Pennsylvania State University

MAJ. BRUCE M. HAMILTON, B.S., United States Military Academy; M.S., Purdue University

MAJ. KRAIG U. HANSEN, B.S., United States Military Academy; M.S., University of Illinois

MAJ. RICHARD K. JACKSON, B.S., United States Military Academy; M.S., Georgia Institute of Technology

MAJ. FRANK D. MILLER, JR., B.S., United States Military Academy; M.S., (NE), North Carolina State University

- MAJ. CHARLES P. OTSTOTT, B.S., United States Military Academy; M.S., Purdue University
- MAJ. BRIAN G. SCHULTZ, B.S., United States Military Academy; M.S., Massachusetts Institute of Technology
- MAJ. ROBERT L. SOPER, B.S., United States Military Academy; M.S., United States Naval Postgraduate School
- MAJ. JAMES M. STOKES, B.S., United States Military Academy; M.S., University of California (Davis)
- CPT. CLARK T. BALLARD, JR., B.S., United States Military Academy; M.S., United States Naval Postgraduate School

Instructors

- LTC. AUSTIN P. LOWREY, B.S., University of Hawaii; M.S., United States Naval Postgraduate School; Ph.D., Massachusetts Institute of Technology
- LTC. ARTHUR L. RICH, JR., B.A., Mercer University; M.S., United States Naval Postgraduate School
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- CPT. ROBERT M. STEELE, B.S., United States Military Academy; M.S., Pennsylvania State University

Standard Courses

PH 201. PHYSICS I

First Term — Prerequisites: None

This course is devoted primarily to the fundamentals of mechanics. A laboratory program designed to develop an appreciation of scientific techniques and illustrate fundamental physical concepts is an integral part of the course. *4 Credit Hours.*

PH 202. PHYSICS II

Second Term — Prerequisite: PH 201

This course is devoted primarily to the fundamentals of electricity, magnetism and optics. A laboratory program designed to develop an appreciation of scientific techniques and to illustrate fundamental physical concepts is an integral part of the course. *4 Credit Hours.*

PH 303. PHYSICS III

Either Term — Prerequisites: PH 201 and PH 202

This course is primarily concerned with the fundamentals of quantum physics as applied to atoms, molecules, solids and nuclei. A laboratory program designed to familiarize the student with radiation detection and counting devices is an integral part of the course. It includes experimental determination of decay constants and absorption coefficients. *4 Credit Hours.*

Advanced Courses

PH 251. ADVANCED PHYSICS I

First Term — Prerequisites: None

This course for selected students is devoted to the study of mechanics of particles and finite bodies. Vector and scalar fields and the effects of special relativity are introduced. A laboratory program designed to develop an appreciation of scientific techniques and to illustrate fundamental physical concepts is an integral part of the course. A number of extended laboratory exercises of a more sophisticated nature are also required. *4 Credit Hours.*

PH 252. ADVANCED PHYSICS II

Second Term — Prerequisite: PH 251. (Selected students from PH 201 may be permitted to take this course.)

This course for selected students provides a study of electromagnetic interactions and wave phenomena. The basic principles of physical optics are introduced. The laboratory program of PH 251 illustrating fundamental principles (including extended laboratory exercises) is continued. *4 Credit Hours.*

PH 353. ADVANCED PHYSICS III

Either Term — Prerequisites: PH 251 and 252. (Selected students from PH 201 and PH 202 may be permitted to take this course.)

This course develops the fundamental concepts of quantum physics which are then applied to a basic study of atomic and nuclear physics. The course includes an introduction to solid state physics and high energy particle physics. The laboratory program of PH 251 and PH 252 is continued and includes radiation detection and counting devices, determination of decay constants and absorption coefficients. *4 Credit Hours.*

Elective Courses

PH 383. INTRODUCTION TO THEORETICAL PHYSICS I

First Term — Prerequisite: PH 201 or PH 251

An intermediate development of selected topics in theoretical physics. Topics covered include (1) the Lagrangian formulation of mechanics, with selected problems in particle dynamics, central force motion, and scattering and (2) 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 or PH 252

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

PH 483. SOLID STATE PHYSICS

Second Term — Prerequisite: PH 303 or PH 353

A course in the basic fundamentals of solid state physics covering crystal structure, lattice waves, specific heat, dielectric properties, ferroelectrics, diamagnetism, paramagnetism, ferromagnetism, free electron theory of metals, Fermi-Dirac statistics, electrical and thermal conductivity, thermionic emission, Hall effect, band theory, Brillouin Zones, semiconductors, and lattice defects. *2.5 Credit Hours.*

PH 484. QUANTUM MECHANICS

First Term — Prerequisite: PH 303 or PH 353

An introductory course stressing the physical meaning of quantum theory including the failure of classical theories, de Broglie waves, wave functions, and eigenvalue problems, Schroedinger equations, free particle, potential well, harmonic oscillator, hydrogen atom, operators; many-electron atoms, and the Pauli principle. *2.5 Credit Hours.*

PH 486. EXPERIMENTAL PHYSICS

Either Term — Prerequisites: PH 303 or PH 353 and one elective in Physics.

Individual advanced laboratory experiments selected by the student and performed under the supervision of a faculty advisor. Possible experiments include: normal modes of coupled systems, laser optics, Frank-Hertz, electron paramagnetic resonance, Zeeman effect, Mössbauer effect, mass spectroscopy and nuclear events. *2.5 Credit Hours.*

PH 487. NUCLEAR REACTOR THEORY

Either Term — Prerequisite: PH 303 or 353

A review of modern physics pertaining to reactor theory, radiation detection, and health physics, neutron moderation, neutron cycle balance in homogeneous and heterogeneous systems, neutron diffusion, critical equation, and critical size, short and long term transient effects, and stability. The laboratory portion of the course includes practical exercises in instrumentation and radiation detection; neutron activation and cross-section determination, thermal diffusion and Fermi age, flux distribution buckling and critical size of the subcritical reactor. *2.5 Credit Hours.*



PH 488. NUCLEAR PHYSICS

Second Term — Prerequisite: PH 303 or PH 353

A study of selected topics in nuclear physics to include: properties of the nucleus, radius, binding energy, angular momentum, magnetic moment, a quantum mechanical treatment of alpha decay and the deuteron, nuclear models, and basic nuclear reactions. *2.5 Credit Hours.*

PH 489. SPECIAL TOPICS IN PHYSICS

Either Term — Prerequisites: PH 303 or PH 353, two electives in Physics, and permission of Head of Department.

Individually supervised research and study in a selected problem area.

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CPT. DAVID K. RIGGS, B.S., United States Military Academy; Diplo., University of Geneva

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. Economic institutions, macroeconomics, and micro-economic principles, and rational decision making methods are studied. *2.5 Credit Hours.*

SS 302. UNITED STATES GOVERNMENT AND ECONOMICS OF NATIONAL SECURITY

Second Term — Prerequisites: None

This course is a study of the American political system with emphasis on the processes, structures, and problems of the national government, including a survey of basic aspects of state and local administration. Democratic theory and its American application provide the analytic framework for the course, and careful consideration is given to both formal and informal institutions which play a vital role in the American political process. The subcourse in the Economics of National Security, using concepts drawn from Social Sciences 301, 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, France, Germany, and the USSR) and Asia (China, India, and Japan). Emphasis is given to comparative analysis of political structures and to the functioning political system in democratic and non-democratic as well as modernized and developing nations. The study of the Asian nations includes a survey of the nations' historical backgrounds. *4 Credit Hours.*

SS 407. INTERNATIONAL RELATIONS

Second Term — Prerequisites: None

An interdisciplinary study of the relations between nations, building upon previous Social Sciences courses, with particular emphasis upon forces changing the international system and the role of the United States since World War II. The theories and practices of interstate behavior are studied as well as the basic influences and factors which condition the formulation and execution of U.S. foreign policy. *4 Credit Hours.*

Advanced Courses

SS 351. ECONOMICS: PRINCIPLES AND PROBLEMS

First Term — Prerequisite: Permission of the instructor.

In addition to the stated objectives of SS 301, this course provides qualified volunteers with (1) a rigorous understanding of the basic principles of micro-economic theory and (2) competence in an analytic method which can be applied to a wide range of optimization problems. Recommended for cadets planning further study in the field of economics. *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. Emphasis is placed on political power and

its impact upon policy decisions. Extensive use of case materials drawn from contemporary issues in government. *2.5 Credit Hours.*

SS 451. COMPARATIVE POLITICAL SYSTEMS: EUROPE AND ASIA AND CHINA

First Term — Prerequisite: Permission of the instructor.

This advanced course is open to 60 cadets who stand in the upper half of their class in social sciences and who volunteer for the advanced course in lieu of the standard course. The first third of the course will survey the essential concepts of the standard course, while the latter two-thirds will explore in greater depth the history, economy, culture, political system, and international relations of Communist China. *4 Credit Hours.*

SS 457. ADVANCED INTERNATIONAL RELATIONS

Second Term — Prerequisite: Permission of the instructor.

This advanced course is open to selected cadets who volunteer for the advanced course in lieu of the standard course. Among its purposes is the development of an appreciation for the concepts, theories, and methodologies pertaining to the academic pursuit of international politics by use of the seminar method. The course is tailored to allow cadets to pursue their individual interests 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. The first quarter of the course will survey the basic factors, concepts, and theories of international relations. After establishing a solid foundation, the course will concentrate on the formulation of foreign policy, the international political systems, and selected problems of international politics. *4 Credit Hours.*

Elective Courses

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. LATIN AMERICAN STUDIES

Either Term — Prerequisite: None

This course surveys the economic, social, cultural, and political systems of contemporary Latin America. It begins by discussing the operational characteristics and historical evolution of the region's economy, society and culture. Attention next focuses on the political systems of specific countries and on how interest groups compete within each for scarce resources. Special emphasis is given to the demands of peasants, workers, urban poor, traditional conservatives, military and middle sectors. Emphasis subsequently shifts to the most important Latin American styles of political decision making. Finally, an analysis of political system capabilities for resolving interest group demands serves as a springboard to discuss political change. This final focus also stresses the process for transferring power-guerrilla warfare, the coup d'etat and elections. *2.5 Credit Hours.*

SS 385. COMPARATIVE ECONOMIC SYSTEMS

Either Term – Prerequisite: SS 301 (May be taken concurrently)

This course analyzes Capitalism, Socialism, and Communism 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. In tracing the evolution of Western democracy and considering alternatives to it, 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). May be taken by Third Classmen selected for the debate program.

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. Readings are interdisciplinary focusing on the nature of the problems 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 in 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 482. ECONOMIC ANALYSIS:
THEORY AND DEFENSE APPLICATIONS**

Either 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 course covers the main body of microeconomic theory as it explains behavior in a market economy. 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. Consequently it examines internal violence abroad, present and future; 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 and its policies. The seminar is principally an analysis of U.S. policy. Visiting authorities conduct a variety of seminars and discussions. *2.5 Credit Hours.*

SS 484. INTERNATIONAL ECONOMICS AND ECONOMIC DEVELOPMENT

Second Term — Prerequisite: 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 will cover the classical theory of comparative advantage and its modifications. Growth of developing nations will be discussed in terms of capital formation. 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. Readings will emphasize the interrelationship of economic problems of developing areas and the international economic system. *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 and sharpen analytical tools and concepts applicable and useful for assisting the cadet's understanding of the political processes, social structures and economic organization normally associated with traditional and transitional societies. Due to the complex nature of change in these societies, the course does not concern itself with boundaries between academic disciplines, but draws upon ideas, insights, and examples from all relevant disciplines in the social sciences. This includes the use of perspectives drawn from the literature of political science, sociology, economics, and cultural anthropology. The course focuses upon the application of these theories and ideas to selected case studies in South Asia and Sub-Saharan Africa. *2.5 Credit Hours.*

SS 486. POLITICAL AND CULTURAL ANTHROPOLOGY

Either Term — Prerequisite: None

An introduction to the discipline of anthropology, 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 and based on a wide variety of ethnographic data, are made in order to point out the value and applicability of anthropology. *2.5 Credit Hours.*

SS 487. SEMINAR IN PUBLIC POLICY (Honors — Research)

Either Term — Prerequisite: Permission of the instructor.

This seminar affords selected cadets the opportunity to research on a continuous basis in selected problems of public policy. Research areas may include

international affairs, problems of the national and international economy, and political science. Emphasis is placed on developing a skill in critical writing and in research. *2.5 Credit Hours.*

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Standard Courses

PL 202. GENERAL PSYCHOLOGY

Both Terms — Prerequisites: None

This course provides the cadet with an understanding of scientific psychology required in the development of an understanding of the human aspects of command, the psychological basis of military operations, and the psychological basis

of military technology. The course develops an understanding of the nature of the behavioral sciences and the delineation of psychology as a scientific discipline within those sciences. Specific aims and areas of study which support the general objective of the course 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: None

Course supplements the basic content of PL 202, General Psychology, by presenting to selected cadets additional course material necessary to develop an appreciation of psychological research in the development of military doctrine, military technology, and military leadership. In addition to the specific aims of PL 202, this course also utilizes a laboratory program designed to develop an understanding of scientific methodology used in the behavioral sciences and to expose cadets to the current research being conducted in the field of psychology. *2.5 Credit Hours.*

PL 201. MILITARY INSTRUCTOR EDUCATION

Third Class Summer and Spring Semester

This course is in two parts. The first part is conducted during third class summer and the second part during the spring semester. The total course is designed to assist the cadet in the development of 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

Course contributes to the leadership development of cadets through an interdisciplinary study of behavioral science information related to leadership and the effective application of this information in a military environment. Individual behavior, the group processes and the societal environment are examined as sources of influence on the leader and the led. 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 in industrial, government and military organizations. It supports and expands the course in leadership as well as programs in management, developing an understanding of common human behavior across institutions. *2.5 Credit Hours.*

PL 482. SOCIOLOGY

Both Terms -- Prerequisites: PL 202, PL 252 or validation

The course provides the cadet with the sociological perspectives and concepts necessary for the analysis of contemporary societies and cultures. It introduces sociology as a discipline by describing society in terms of the elements of social structure and of the social processes through which their interrelations may be

understood. As such, it 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. *2.5 Credit Hours.*

PL 483. SOCIAL PSYCHOLOGY

Both Terms -- Prerequisites: PL 202, PL 252 or validation

This course provides the cadet with an understanding of the processes and means by which individual behavior is shaped and modified through interaction with others. Initial discussion centers on the domain, the problem areas, and the nature of the interaction itself. It then moves to the consideration of more complex social psychological processes to include, interpersonal perception, social motivation, and attitude formation and change -- concepts which color the individual's outlook toward his physical and social environment. The principal concepts and findings which are fundamental to the study of influence processes are finally applied to group structures and processes, with emphasis on the features of interaction which lead to the emergence and maintenance of regular and stable relations between individuals. *2.5 Credit Hours.*

PL 484. AMERICAN MILITARY INSTITUTIONS AND MANPOWER

Spring Term -- Prerequisites: PL 202, PL 252 or validation

There are two general objectives for this course. One of these is to provide the cadet with a broad knowledge of military institutions of the United States, their roles and functions, the manner in which they are changing and adapting to modern conditions, and their impact on a changing democratic society. The other objective is to provide the cadet with a sociological analysis of the United States military institutions which will provide a conceptual basis for further studies in military affairs, international relations, political science or management. *2.5 Credit Hours.*

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. ORGANIZATION THEORY

Prerequisites: PL 202 or validation

This course allows the cadet to develop an analytical framework for the study of all social organizations as dynamic, living units. Readings and reports from current literature focus on modern theories, organizational goals and structures as well as the interaction of individual and cultural influences in affecting organizational change. 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. Empirical methods of study are emphasized including quantitative and qualitative analysis as well as survey research methods. 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 in PL 484, American Military Institutions. *2.5 Credit Hours.*

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MR. JAMES E. PEARSON, B.A., M.A., University of Oklahoma; M.A. (Library
Science), University of Minnesota

Assistant Librarian, Reference and Resource Utilization

MRS. MARILYNN K. SMITH, B.A., Butler University; M.A., University of
Colorado; M.S.L.S., Columbia University

Chief, Special Collections

DR. EDWARD P. RICH, B.A., Haverford College; D.D.S., University of Penn-
sylvania; M.S.L.S., Drexel Institute; Lilly Fellow, Indiana University

Chief, Archives and History

MR. STANLEY P. TOZESKI, A.B., Clark University; M.A., University of Massa-
chusetts

Librarian, rare books cataloging

MR. ALAN C. AIMONE, B.S., Eastern Illinois University; M.A.L.S., Rosary
College

Librarian, audio-visual

MR. JOSEPH M. BARTH, B.A., Iona College; M.L.S., St. John's 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. CONNOILLY, B.A., St. Joseph's College for Women

Librarian, periodicals

MRS. JOHANNA R. de ONIS, B.A., State University of New York at New Paltz

Librarian, serials

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, reserve books

MR. ALLEN DEAN 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, acquisitions

MRS. ROSEMARY A. MITCHELL, B.A., Stanford University; M.L.S., University of California at Berkeley

Librarian, cataloging

MISS ANNA E. PIERCE, B.S., State University of New York at Genesee

Assistant Archivist

MR. KENNETH W. RAPP

Librarian, special projects

PFC MICHEL H. RIDGEWAY, B.A., Bowdoin College; M.S.L.S., Columbia University

Librarian, cataloging

MISS SHARON F. WILBUR, B.A. and M.L.S., Texas Woman's University

The library book collection contains approximately 300,000 volumes. The library building has a storage capacity for 500,000 volumes and provides seating for over 1,000 readers. Current subscriptions include 1,300 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 microfilm holdings. The audio-visual resources include approximately 5,000 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 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 for the library were made between 1815 and 1817 when Major Sylvanus Thayer, Superintendent USMA, 1817-1833, on an official journey to Europe was

authorized by 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 subjects. The library's extensive holdings in the areas of military art, history and technology have established its reputation as an important military research library.

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, a branch of the Special Collections Division, maintains cadet 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, including the USMA Archives, is 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 5 per cent of each class, may be selected for immediate return to the graduate school of their choice. 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, forty-nine 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, kindness, 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."

OLMSTED 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 São 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 87 have received honorable mention.

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

- Theodore Shabad, Soviet Correspondent, New York Times,
"Mineral, Fuel, and Power Resource Distribution in USSR"
- LTC. R. H. Hammond (Ret.), School of Engineering, North Carolina State,
"Graphical Calculations: Functional Scales"
- James Endler, Vice-President, Rishman Realty Company,
"Civil Construction"
- D. D. McCracken, McCracken & Associates, Inc., "How to Change a Computer from Slave to Master Without Really Trying"
- Dr. James W. Head, Lunar Exploration Dept., Bellcomm, Inc.,
"Lunar Geology & the Exploration of the Moon"

DEPARTMENT OF ELECTRICAL ENGINEERING

- BG. Richard C. Horne, III, Comm Signal School, "Electronics"

DEPARTMENT OF ENGINEERING

- Mr. Richard C. Maguire, U.S. Army Weapons Command,
Rock Island Arsenal and COL. Rafert, Small Arms Agency,
"Army Small Arms Program"
- Dr. Edward Teller, Lawrence Radiation Laboratory, University of California, "Engineering & Nuclear Energy"
- LTC. Vandenberg, Director, Corps of Engineers, Nuclear Cratering Group, Livermore, California, "Nuclear Cratering"
- John Meyer, Structural Architect, Sverdrup & Parcel, Inc.,
"Cadet Athletic Center – Structural Concepts"

DEPARTMENT OF ENGLISH

- Prof. Loren Baritz, Professor of History, New York State University, Albany, "American Thought and Literature"
- Prof. Roland M. Frye, University of Pennsylvania,
"Paradise Lost and the Visual Arts"

- Prof. Howard M. Jones, Harvard University,
"Ralph Waldo Emerson"
- Prof. Richard Hartzell, State University of N. Y.,
"Techniques of Film Making"
- Mr. John A. Ciardi, Poetry Editor, Saturday Review of Literature,
"Poetry, Its Form & Function"
- Lewis Gifford, Kim & Gifford Productions, New York,
"TV as Art Form"
- Dr. Charles H. Monson, Associate Vice-President, University of Utah,
"Making Philosophy Practical"
- Dr. Robert Walker, George Washington University,
"Literature and Social Action in America, 1865-1914"
- Archbishop F. Sheen, Titular Archbishop of Newport,
"Philosophical Aspects of Religion"
- Prof. Kazin, State University of New York at Stony Brook,
"American Literature"
- Prof. Nagel, Columbia University, "American Literature"
- Prof. Bruce Aune, Professor of Philosophy, University of
Massachusetts, "American Thought & Literature"
- Dr. William T. H. Jackson, Professor of Germanic Languages,
Columbia University, "Chaucer as a Man for our Times"
- Prof. James McCrimmon, Author & Educator,
"Problems that Face Student Writers"
- Prof. Rosenblatt, N. Y. U. School of Education,
"Literary Experience in Modern World"

DEPARTMENT OF FOREIGN LANGUAGES

- COL. Gustav von Detten, German Army Attache, Washington, D.C.,
"Federal Defense Ministry As a Part of NATO"
- Mr. Nicholas Maltzoff, Professor of Russian, Vassar College,
"Russian Geography"
- Camille Bauer, Professor of French, Brown University,
"French Educational System"
- Francis Millet Rogers, Professor of Romance Languages,
Harvard University, "Aspects of Portuguese Navigation
and Exploration"
- Mr. Nicholas Fersen, Russian Instructor, Williams College, "Vlasov"
- Lt. Comdr. Bertrand S. D'Espina, Saint Luc, French Naval Officer,
MMF Saclant Naval Base, "The French Role in the
American Revolution"

DEPARTMENT OF HISTORY

- Dr. Donald Gillin, Professor of History, Vassar College,
"Revolutionary Warfare in China 1927-1945"
General Bruce C. Clarke, USA (Ret.), "Generalship"
Honorable Douglas Henderson, Dept. of State, Washington, D.C.,
"Revolution in Bolivia"
General Jacob L. Devers, USA (Ret.),
"6th Army Gp in Southern France"
Prof. Frank Kierman, Princeton University, "The Civil War in China"
Prof. David Chandler, Lecturer, RMA Sandhurst,
"Guerrilla Warfare in Malaya"
Dr. Von Luttichau, Historian, "World War II in Russia"
Dr. Russell Weigley, Professor of History, Temple University,
"Professionalism in the U.S. Army, 1870-1900"

DEPARTMENT OF LAW

- Prof. Oliver J. Lissitzyn, Scholar in Residence for International Law
at Naval War College, "International Law"
BC. Parker, Assistant JAG for Military Law, "Military Justice"
Mr. Albert J. Gaynor, Executive Assistant to US Attorney,
Southern District of N. Y., "The Role of the US Attorney's
Office in the Federal Judicial System"

DEPARTMENT OF MATHEMATICS

- Dr. Richard Di Prima, Professor of Math, RPI,
"Differential Equations"
Dr. Harper, Manager, Industrial Venture Team, General Mills, Inc.,
"Monte Carlo Simulation to Optimize Plant Configuration"

DEPARTMENT OF MECHANICS

- Mr. Ingraham & Ralph Papirno, US Army Materials & Research
Center, Watertown, Mass., "Modern Applications of
Strength of Materials"
Mr. M. Kornitzki, Army Material and Mechanics Research Center,
"Modern Materials"
Prof. A. E. Bergles, Georgia Institute of Technology,
"Boiling Heat Transfer"

- COL. Frank Borman, Field Director, Space Station Testing Group,
"Apollo Program"
- Prof. J. P. DenHartog, Professor of Mechanical Engineering, MIT,
"Mechanical Vibrations"

DEPARTMENT OF SOCIAL SCIENCES

- Hon. R. B. Froehlke, Assistant Secretary Defense for Administration,
"Defense Management in the Nixon Administration"
- Edward M. Fleming, HF Du Pont Winterthur Museum,
"Images of America 1607-1860"
- Dr. C. Wagley, Columbia University,
"Social Obstacles to Progress in Latin America"
- Prof. S. Adler, New York University,
"Isolationism of 1930's Revisited"
- Dr. Abdul Said, American University, "North Africa Today"
- Dr. J. Jose, American University,
"International Organization and National Security"
- Dr. W. Franklin, Dept. of State,
"Coalition Diplomacy in World War II"
- Mr. Herman Kahn, Hudson Institute, "The Year 2000"
- Dr. H. Schwartz, New York State University System,
"Problems of the Soviet Economy"
- Prof. L. Morton, Dartmouth College,
"The Decision to Drop the Atomic Bomb, New Perspectives"
- LTC. J. Seigle, DA, Office C/S and MAJ. Peter Dawkins,
Princeton University, "Military Professionalism Panel"
- Prof. Warren Hassler, Jr., Pennsylvania State University,
"American Civil War"
- Mr. Bruce K. McClury, Deputy Undersecretary for Monetary Affairs,
"US Trade & Financial Policy"
- Prof. Barnett, Brookings Institute, "The People's Republic of China"
- BG. Alexander Haig, Military Assistant, NSC, "National Security
Decision-Making in the Nixon Administration"
- Honorable D. Pryor, US Congress, "Role of the Congressman"
- Prof. A. Link, Princeton University, "W. Wilson, the Diplomat"
- Mr. W. Sullivan, Assistant Director, FBI,
"Selected Dimensions of American Social Crisis"

- Dr. J. C. Hurewitz, Columbia University,
 "Impact of *Fedayeen* on Middle East Politics"
- Honorable P. Ylvisaker, Former Director of Comm Affairs,
 State of New Jersey, "Urban Crisis"
- LG. William De Puy, Assistant Vice Chief of Staff,
 "The Post-Vietnam Army"
- Dr. William Franklin, Director, Historical Office, Dept. of State,
 "Wartime Diplomacy"
- Prof. Hans Schmitt, New York University, "Inter-War Diplomacy"
- COL. J. R. Franklin, DCSOPS, "The Role of the Military in Africa"
- Prof. L. J. Oliva, New York University, "Nazi-Soviet Pact"
- Prof. Harry Schwartz, New York University, "Soviet Economy"
- Dr. Plank, Brookings Institute, "Current Development
 In US Policy Toward Latin America"
- BG. Sidney Berry, Assistant Commandant Infantry School, and
 LTC. Zeb Bradford, Office of the Vice Chief of Staff, Army,
 "Military Professionalism Panel"
- Prof. E. R. May, Harvard College, "The Eisenhower Era"
- Prof. Sam Williamson, Harvard College,
 "Intervention in the Caribbean"
- Dr. Hahn, Hudson Institute, "A Look Into the Future"
- Hon. Bruce K. MacLaurey, Deputy Undersecretary for Monetary
 Affairs, Office of Secretary of Treasury,
 "International Monetary Affairs"

OFFICE OF MILITARY PSYCHOLOGY AND LEADERSHIP

- Dr. Lawrence D. Brennan, Professor of Business Communication,
 New York University, "General Communication Theory"
- Mr. John J. McCarthy, Business Consultant, "Military Leadership"
- Mr. Tom Leo, Manager, General Motors, Tarrytown, N. Y.,
 "Training in GCM"
- LTC. Richard G. Stilwell, Deputy C/S for Military Operations,
 "The Leadership Challenge"
- Dr. Baradey, University of Hawaii, "Social Stratification"
- Dr. John D. Weisz, Director Human Engineer Labs,
 "Military Application of Psychology"
- LTC. Charles Thomas, Psychology Consultant to Surgeon General,
 "Mental Health of the American Soldier"

Dr. R. Nathan, Institute for Political Psychology and
International Psychology, "Psychological Warfare"

Dr. Morris Janowitz, Professor of Sociology, University of Chicago,
"The American Soldier"

Mr. Joseph Littlejohn, Housing Officer, NAACP,
"Social Responsibility of Management"

OFFICE OF MILITARY INSTRUCTION

BG. John H. Cushman, CO Fort Devens, Mass., "Career Challenges"

COL. Sam V. Wilson, Assistant Commandant, US Army Institute for
Assistants, "US Army in Stability Operations, World Wide"

MAJ. J. Gibbs, Nuclear Weapons Section, Weapons Dept. Fort Sill,
Oklahoma, "Impact of Nuclear Weapons"



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 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.

	<i>Page</i>
CORPS OF CADETS	112
ORGANIZATION	112
PAY AND ALLOWANCES	112
APPOINTMENT UPON GRADUATION	112
APTITUDE FOR THE SERVICE	112
TYPICAL DAILY SCHEDULE	114
DEPARTMENT OF TACTICS	115
OFFICES OF INSTRUCTION	115



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 a 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 \$2,500 per year from which they must pay for their uniforms, textbooks, and incidentals. Quarters, rations, 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.

APTITUDE FOR THE SERVICE

The Aptitude for the Service 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 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 in Aptitude for the Service 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 in certain instances 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 Departments 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.

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

BRIG. GEN. SAM S. WALKER, B.S., United States Military Academy; M.S., George Washington University

Aide-de-Camp

CPT. DAVID P. RIVERS, B.S., United States Military Academy

Deputy Commandant

COL. RICHARD J. TALLMAN, B.S., United States Military Academy; Army War College

Brigade Staff, S1

LTC. ANTHONY P. DeLUCA, B.S., United States Military Academy

Brigade Staff, S4

LTC. RICHARD S. KEM, B.S., United States Military Academy; M.S., University of Illinois

Brigade Staff, Operations Officer

LTC. ROBERT J. HARAS, B.S., United States Military Academy; M.A., Middlebury College

Brigade Staff, Cadet Activities Officer

MAJ. SAMUEL P. COLLINS, B.S., United States Military Academy; M.S., University of Illinois

Commanding Officer, First Regiment

COL. FLOYD G. STEPHENSON, B.S., United States Military Academy

Commanding Officer, Second Regiment

COL. CLAYTON L. MORAN, B.S., United States Military Academy

Commanding Officer, Third Regiment

COL. RAYMOND L. MALADOWITZ, B.S., United States Military Academy; M.A., Middlebury College

Commanding Officer, Fourth Regiment

COL. WILLIAM L. WEBB, B.S., United States Military Academy; M.A., University of Pennsylvania

OFFICES OF INSTRUCTION

OFFICE OF MILITARY INSTRUCTION

Director

COL. R. L. GRUENTHER, B.S., United States Military Academy; M.S., Springfield College



*Upon the fields of friendly strife,
are sown the seeds that, upon
other fields, on other days, will
bear the fruits of Victory.*



General Douglas MacArthur

Deputy Director

LTC. S. M. VINCENT, B.A., University of Omaha

Career Branch

CHIEF: LTC. R.E. AYERS, B.S., United States Military Academy; M.S., California Institute of Technology

SR. ADA. INSTR.: MAJ. J. BERINATO, B.S., United States Military Academy

SR. ARMOR INSTR.: MAJ. R. B. GARRETSON, B.S., United States Military Academy

SR. ENGR. INSTR.: MAJ. J. J. HARMON, B.S., United States Military Academy; M.S., Princeton, University

SR. FIELD ARTY. INSTR.: MAJ. F. J. BOCHNOWSKI, B.S., United States Military Academy

SR. INFANTRY INSTR.: MAJ. W. S. CARPENTER, B.S., United States Military Academy

SR. MILITARY INTELLIGENCE INSTR.: MAJ. P. J. MURPHY, B.S., United States Military Academy

SR. SIGNAL INSTR.: MAJ. R. C. BAUGH, B.S., United States Military Academy; M.S., University of Arizona

AVIATION INSTR.: MAJ. J. S. HAHN, B.S., United States Military Academy

COURSE DIRECTOR: MAJ. T. H. BRETT, B.A., The Citadel

Military Science Branch

CHIEF: LTC. J. B. TOWER, B.A., Park College; M.S., George Washington University

Course Directors

MAJ. J. R. BLANTON, JR., B.S., United States Military Academy

MAJ. H. H. COVINGTON, B.S., United States Military Academy; M.S., Texas A & M

MAJ. W. W. HARTZOG, B.A., The Citadel

MAJ. W. L. STOCKMAN, III, B.S., Norwich University

MAJ. T. G. STROUP, JR., B.S., United States Military Academy; M.S., Texas A & M University

CPT. J. S. JENKINS, JR., B.A., South Carolina State College

Instructors

MAJ. M. BUSBY, (USMC), B.B.A., University of Michigan; M.B.A., George Washington University

MAJ. J. P. FANNING, B.S., United States Military Academy

MAJ. M. J. HAGUE (British Army), Royal Military Academy, Sandhurst

MAJ. M. J. MORIN, B.A., Knox College

MAJ. W. A. SCHNEIDER, B.S., St. Peter's College

MAJ. J. T. SCOTT, B.S., Texas A & M University

CPT. T. W. KARR, B.S., United States Military Academy

Plans Branch

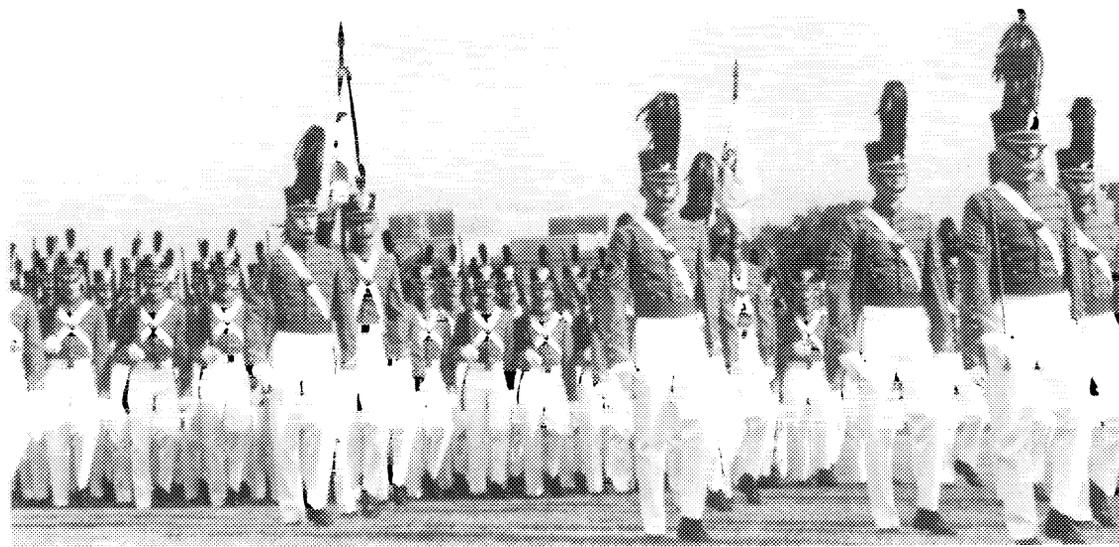
CHIEF: LTC. E. F. RHODES, B.S., United States Military Academy

PROGRAMS OFFICER: MAJ. W. R. LEHRFELD, B.S., United States Military Academy

Plans Officer

MAJ. R. C. ALBERTELLA, B.S., St. Bonaventure University

CPT. W. A. HUSSONG, JR., B.A., University of Hawaii



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. *7.5 Weeks. Ungraded.**

Academic Year

MILITARY SCIENCE I

MS 101. INTRODUCTION TO MILITARY SCIENCE

Instruction 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 designed to develop a basic understanding of the principles and procedures employed in planning and executing military operations and to apply 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, survival and individual protective measures against chemical, biological and radiological attacks; 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

*Satisfactory completion is a prerequisite for receiving full credit for academic year instruction.

small unit tactics at squad, section, and platoon level in both daylight and night operations; to provide orientation on the combat support role of the Field Artillery Battery, the Combat Engineer 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.

*7.5 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 and 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

(1) A period during which the cadet visits Fort Monmouth and Fort Belvoir and receives an orientation on the roles, missions, and organization of two branches of the Army. *Ungraded.**

(2) The cadet has an opportunity to participate in Airborne Training at Fort Benning, Georgia.

*Satisfactory completion is a prerequisite for receiving full credit for academic year instruction.

(3) Duty as a platoon leader with a combat unit of the U.S. Army. *1 Month. Ungraded.**

Academic Year

CAREER TRAINING

MI 302. INTRODUCTION TO CAREER PLANNING

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 OPERATIONS

Instruction addresses the organization and basic principles employed by combined arms forces at battalion level.

1.5 Credit Hours.

MS 302. TASK FORCE SPECIAL OPERATIONS

Instruction applies to 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. *1.0 Credit Hours.*

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, 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

*Satisfactory completion is a prerequisite for receiving full credit for academic year instruction.

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. THE U.S. ARMY IN STABILITY OPERATIONS

Instruction in the 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. *1.5 Credit Hours.*

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 care is provided by the Cadet Counselor in matters that concern environmental or emotional adjustment and by the Cadet Chaplains concerning spiritual matters. 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 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 provide assistance with regard to financial matters upon request.

The Surgeon, USMA will provide counseling or advisory assistance with regard to psychological or psychiatric problems upon request.

Religious Activities

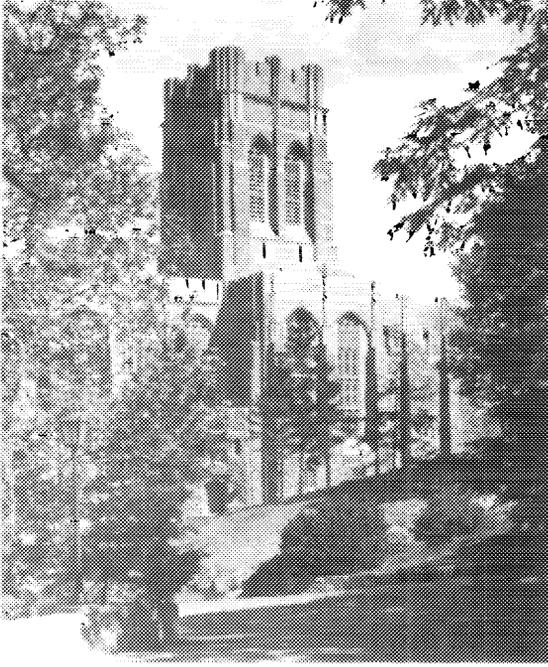
All cadets are provided a sound basic religious atmosphere. Each cadet must attend one of the weekly chapel services — Protestant, Catholic, or Jewish.

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 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. In addition, Denominational Services are conducted each week.

Catholic

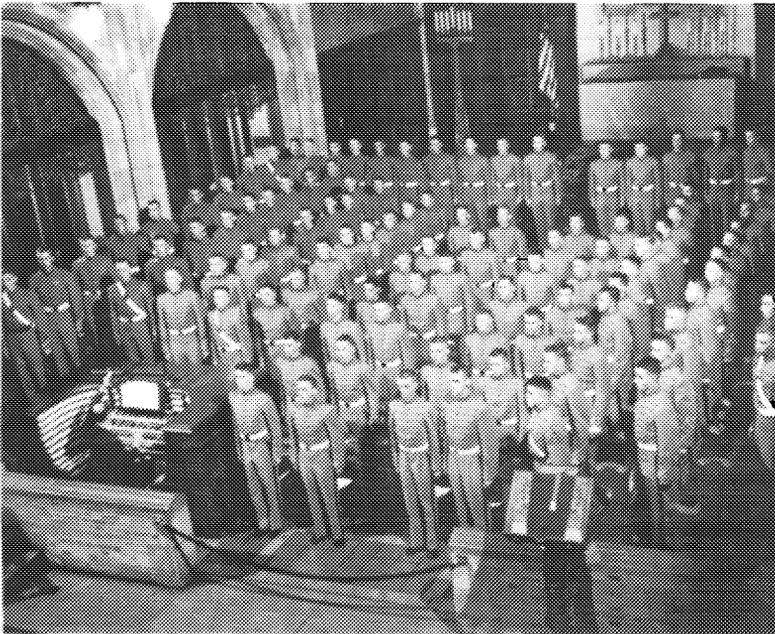
Catholic cadets attend Holy Trinity Chapel, which is the Catholic Chapel on the Post. The Reverend F. McCormick is the Rector. Each Sunday Catholic members of the Cadet Regiments alternate in attending the early and late Masses to give opportunity for assisting at the late Mass. A Cadet Catholic choir sings at the High Masses and

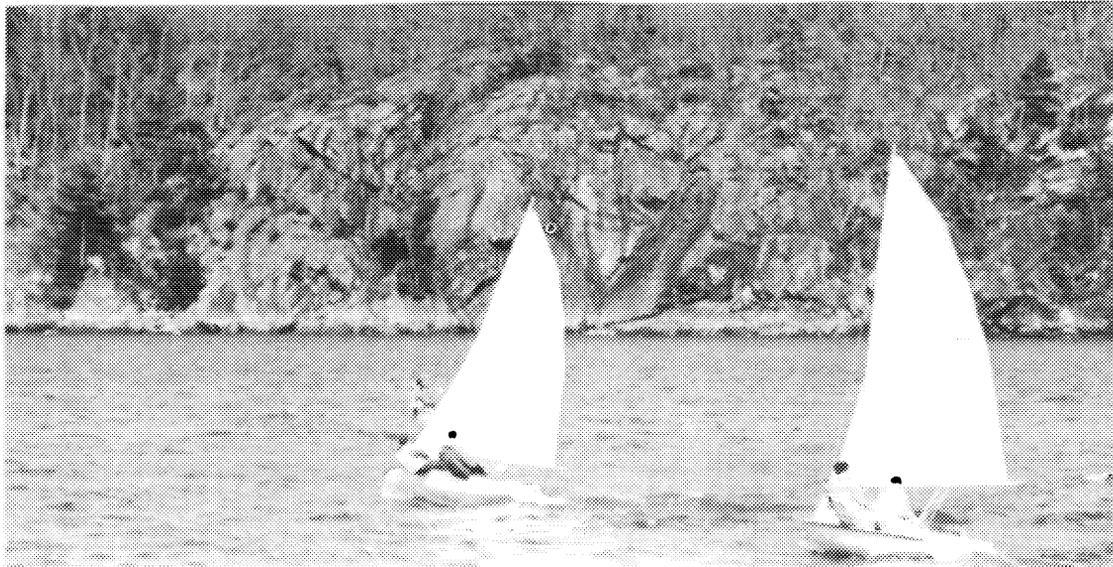


other liturgical ceremonies. Cadet commentators, readers and servers assist at all Cadet Masses. Daily Mass is celebrated at 6:25 a.m. throughout the academic year. Confessions are heard on Friday, daily at Mass time, and as desired. A Cadet Cardinal Newman Forum meets each week. By means of lectures, instructions and seminars, it treats of religion, morals and philosophy. Cadets teach Sunday School every week to preschool and kindergarten children.

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. High Holy Day Services are held for the cadets at Temple Emanuel of Great Neck, L. I., N. Y. Festival Services are conducted in the Old Cadet Chapel, and a special Passover service is held yearly at the U.S. Hotel Thayer. 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.





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.

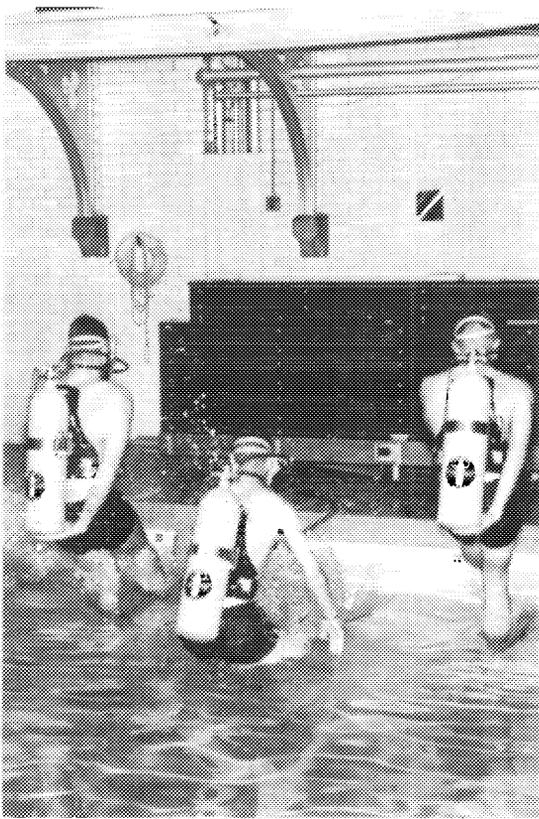
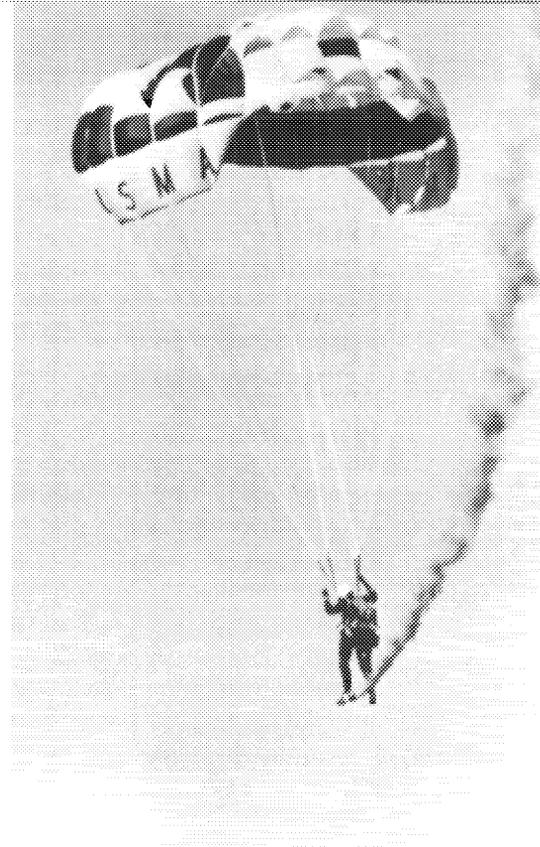
As a future officer, the USMA cadet must be a many-faceted individual. To cope with the complexity of modern warfare and the requirements inherent in leadership, cadets will need to acquire confidence and a working knowledge in a variety of fields. Extracurricular and recreational activities, in conjunction with the Military Academy's academic and military requirements, help give cadets the varied interests, 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 stationed at Camp Buckner during the summer months enjoy swimming, canoeing, fishing, skeet, water skiing, and sailing. In the fall, the Corps takes one or more football trips to metropolitan areas where the bright lights are a welcome diversion. During the winter months, ice skating at Smith Rink and skiing at the Victor Constant Ski Slope are extremely popular. The ski lifts, snow making capabilities 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 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.

In addition to general activities, there are 70 organized extracurricular activities. Student government activities include the Class Committees, Ring and Crest Committees, and the Hop Committees in each Class.





Cadets also have available many sports, organized on a club level, which in conjunction with Varsity Sports, Intramural Athletics, and Scheduled Physical Training develop the physical prowess and skills that will serve them well later. Handball, judo, rugby football, and triathlon sports provide vigorous recreation. Pistol, rifle, and skeet-shooting clubs develop cadet skill with firearms. Competitive sailing and water polo teach cadets to handle boats and take care of themselves in the water. The Cadet Sport Parachute Club provides parachute jumping experience, and the SCUBA Diving Club, underwater training for interested cadets. The techniques of mountain climbing are taught to members of the Mountaineering Club, and the Outdoor Sportsmens Club has facilities for hunting and fishing. The Cadet Riding Club has acquired a few fine mounts for equestrian activities.

Other clubs and organizations supplement academic study. One of the largest and most active of these 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 held at the Military Academy attracts participation by students and leaders from all over the country. To supplement cadet studies are the Mathematics Forum; six Foreign Language Clubs; and Astronomy, Audio, Amateur Radio, Geology and Rocket Clubs. Cadets in the latter club have gained practical space-age experience in rocketry by launching their own homemade miniature rockets and by visiting Cape Kennedy and Redstone Arsenal.

Literary experience is another aspect of cadet extracurricular activity. Cadets put out their own yearbook, *THE HOWITZER*; their own monthly magazine, "THE POINTER;" a small handbook called *BUGLE NOTES* to acquaint new Fourth Classmen (Freshmen) with the customs, traditions, and history of the Military Academy; and "Slum and Gravy," a bimonthly sports bulletin.

WKDT is the cadet AM/FM radio station, fully equipped for voice broadcasting. Other hobbyists can find a place in the Academy's Chess Club, and cadets interested in fine arts find the activities of the Fine Arts Forum very broadening.

For those who are musically inclined, the Cadet Band and combos; the nationally-famed Cadet Glee Club; the Cadet Protestant, Catholic, and Jewish Chapel Choirs are available to those cadets who desire to sing or play a musical instrument. These groups often perform for national television or concert audiences.

Cadets also teach Sunday School for Post children. Another community service cadet group, the Scoutmasters Council, annually hosts

a Camporee which draws as many as 2500 Boy Scouts from all over the Eastern seaboard.

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. The show is written and produced by cadets, who also provide all the actors.

Organized extracurricular activities are directed and administered almost entirely by the cadets themselves, 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 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 Office, part of the staff for the Commandant of Cadets, helps plan the social and recreational programs for the Corps of Cadets. Four Cadet Hostesses provide assistance to the Commandant of Cadets in developing the program and also assist cadets in obtaining accommodations for their guests during the year.





Intercollegiate Athletics

Athletic Board

BRIGADIER GENERAL JOHN R. JANNARONE, Chairman

BRIGADIER GENERAL SAM S. WALKER

COL. CHARLES R. BROSHOUS

COL. FRANK J. KOBES

COL. A. J. DIELENS, JR. (Secretary)

Director of Athletics

COL. A. J. DIELENS, JR., B.S., United States Military Academy; Army War College

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. JAMES E. BURNS, B.S., Loyola University of Chicago; M.B.A., University of Alabama

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

SGM. HOWARD A. BROSSEAU (Ret.)

Assistant Director for Admissions Support

GEORGE STORCK, B.S., United States Military Academy

CPT. JOHN T. JOHNSON (Assistant), B.S., United States Military Academy

COACHING STAFF

Baseball and 150 lb. Football

ERIC TIPTON, B.A., Duke University

Basketball

ROBERT KNIGHT (Head Coach), B.A., The Ohio State University

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

ROBERT B. GRATZ, B.S., University of Tennessee (Assistants)

JACK HECKER, B.S., Bowling Green University

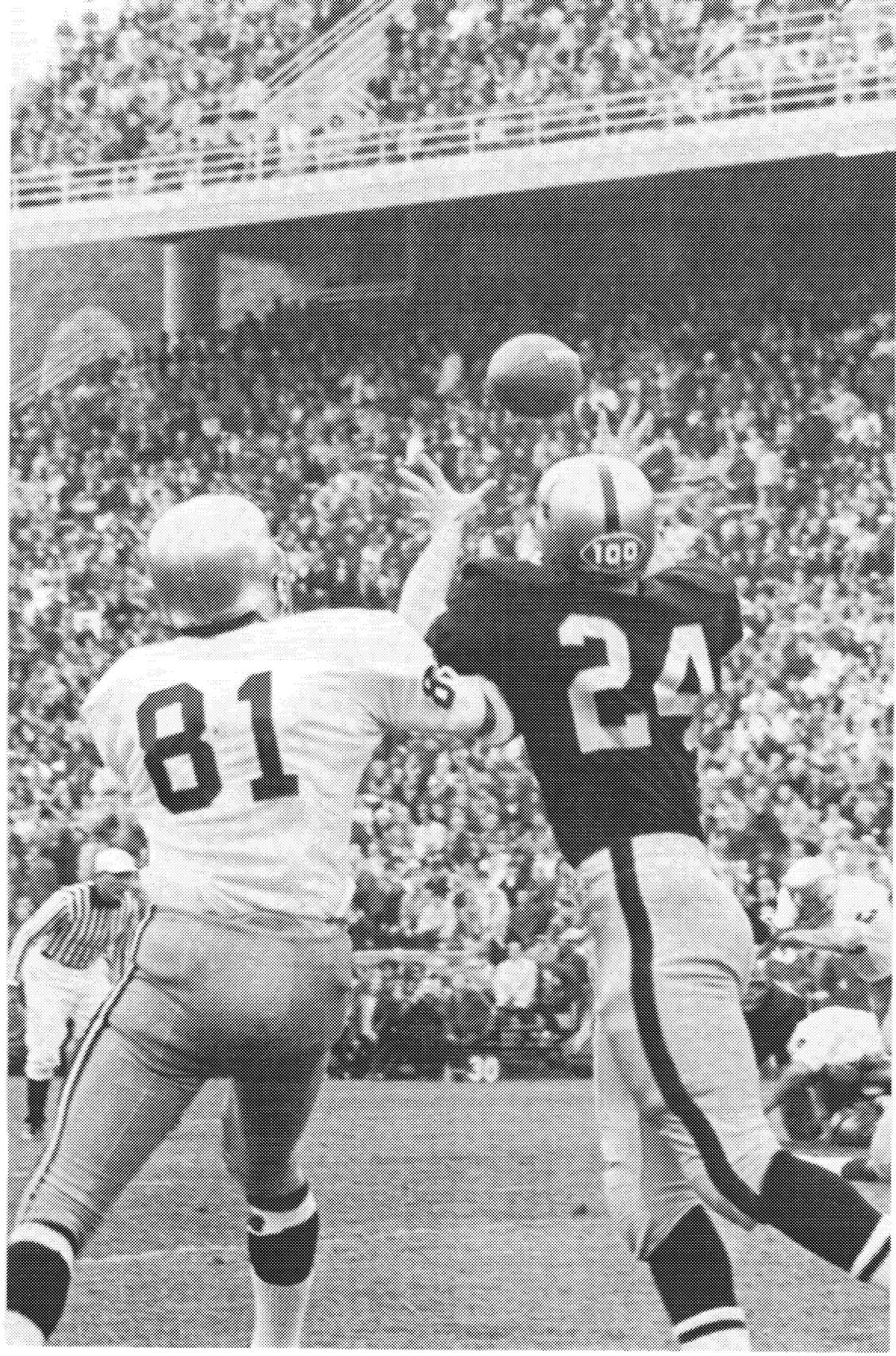
FRED KERN, B.S., University of Maryland

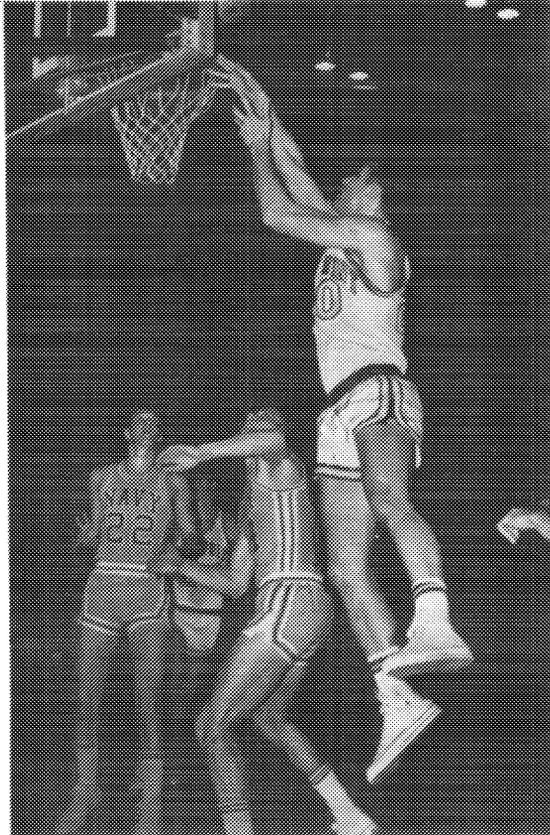
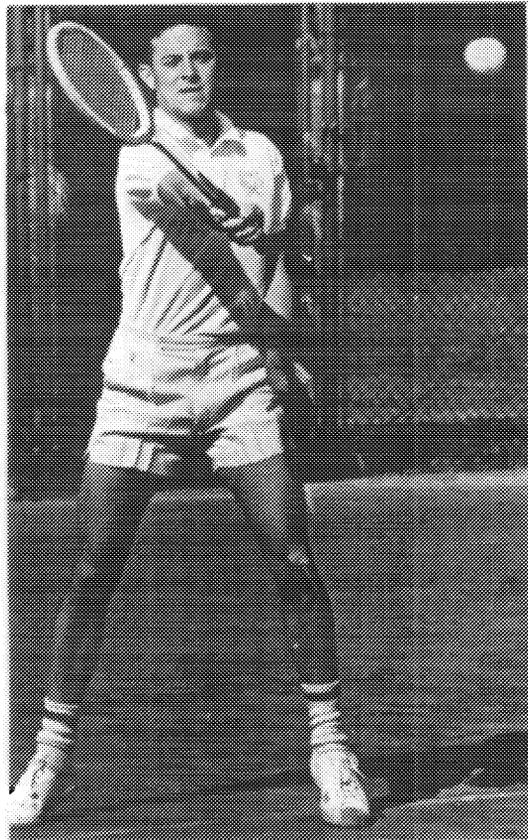
RICHARD LYON, B.A., Colgate University; M.S., Springfield College

JOHN McCAULEY, B.S., Boston College; M.Ed., Pittsburgh State College

ROBERT M. MISCHAK, B.S., United States Military Academy

GEORGE STORCK C Squad (Plebe) Coach





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

To be announced

Swimming

JOHN E. RYAN, JR.

Wrestling

LEROY ALITZ, B.S., State College of Iowa; M.A., University of Iowa

Skating

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 13,000 graduates of the Military Academy. No Government funds are appropriated for equipment, maintenance, and operation of the intercollegiate athletic plant.

The Army Teams are well known for their great spirit and desire. Nearly half of the Corps of Cadets engage 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. Defense was a name synonymous with football at Army for many years but in the last few seasons offense has shared the spotlight.

The schedule features top teams from throughout the United States and is capped by the nationally televised sport spectacular — the Army-Navy Game.

1970 Football Schedule

SEPTEMBER

12 HOLY CROSS at West Point

19 BAYLOR at West Point

26 NEBRASKA at Lincoln

OCTOBER

3 TENNESSEE at Knoxville

10 NOTRE DAME at South Bend

17 VIRGINIA at Charlottesville

24 PENN STATE at West Point

31 BOSTON COLLEGE at Boston

NOVEMBER

7 SYRACUSE at West Point

14 OREGON at West Point

28 NAVY at Philadelphia*

* NAVY is host team

Many Army Teams and individual cadets have participated in the 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 seven years.

Cadets taking part on athletic teams representing the Military

Academy are recognized as part of 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 the Cadets with fine 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," General MacArthur said, "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."

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." Major Pete Dawkins, Army Football Captain, Heisman Trophy winner, All-American Halfback and Rhodes Scholar, and the late Lt. Col. Ed White, the first astronaut to walk in space and track star as a Cadet, are two recent graduates. Col. Frank Borman also won an Army "A."

The Museum

Director

MR. RICHARD E. KUEHNE, B.A., Amherst College

Curator of Design

MR. RAY W. MONIZ, B.F.A., Syracuse University

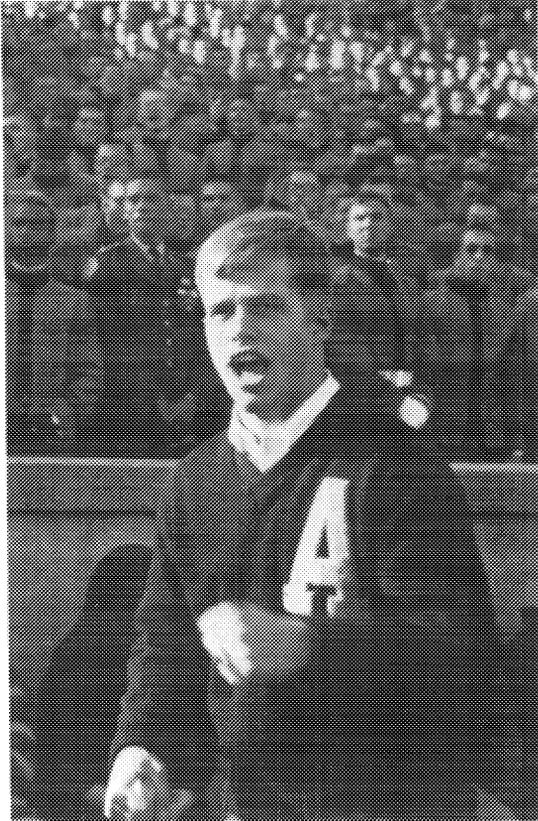
Museum Specialist

MR. ROBERT W. FISCH

Administrative Assistant

MRS. LEONA P. PATTON

The West Point Museum is located in Thayer Hall, occupying the first and second floors of the southwest portion of this academic building. Its galleries and special displays are open without charge to the public throughout the year, every day of the week, from 10:30 a.m. to 4:20 p.m. The Museum is closed only on Christmas and New Year's Day.



Adjacent to the public galleries are the storage and research rooms maintained by the Museum to carry out its primary duty as a college museum by supporting the academic and military education of cadets of the Military Academy. 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. To this end also 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 but its collections actually date back to 1777. After the Battle of Saratoga in October of that year, much of the ordnance captured from the British was sent to West Point. A little later, part of the famous Great Chain stretched across the Hudson at West Point to bar navigation of the river to British men-of-war was 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." The authorities realized that permanent provision was needed for the ever-growing collections, and in 1854 they officially created the Ordnance and Artillery Museum, and established 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 placed on an independent status. A full-time director was appointed in 1949 and given a professional staff.

The West Point Museum has probably the largest collection of military items in the Western Hemisphere. Unlike most military museums the story it tells is not confined to a national scene. One gallery is devoted to the development of military instructions and the art of

war from the days of the Romans until the present; while 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. He is given to understand something of the impact on warfare of such historic events as the Industrial Revolution and nuclear fission.

The visitor's understanding of such matters is heightened by an extensive use of dioramas and full scale models. The visitor can, for example, 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 in the year 197 B.C. to Gettysburg of 1863. In keeping with developments in other American museums, the West Point Museum has endeavored to fulfill its historical mission by treating, in part at least, with intangible cultural concepts and movements as well as with tangible objects.

Service Life

This brief comment on service life is designed primarily to advise the prospective candidate that graduation from the United States Military Academy is but the first step in the mental, moral, physical, and professional preparation of a commissioned officer in the Regular Army of the United States.

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 an officer of the Regular Army, a profession endowed with rich tradition and heritage.

An officer's military career will include assignments which provide increasingly challenging leadership responsibilities. These assignments will be augmented with post graduate 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. He teaches. He guides. He 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 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 grounded 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, the officer gains 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 70 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 Services Colleges 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 the officer 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.

Office of Research

Director of Research

COL. GERALD W. MEDSGER, B.S., United States Military Academy; M.S., California Institute of Technology; M.S., New York University

Chief, Institutional Research Division

MR. CLAUDE F. BRIDGES, B.S., M.A., University of Florida

Chief, Administrative Services and Data Support Division

MR. JOHN W. HOUSTON, B.S., St. Lawrence University

Researchers

CPT. WALTER E. HECOX, B.A., Colorado College; M.A., Ph.D., Syracuse University

CPT. GERALD W. McLAUGHLIN, B.S., M.S., Ph.D., University of Tennessee

SP4 JOEL MORGOVSKY, B.A., Rutgers University; M.A., Fairleigh Dickinson University

DR. RICHARD P. BUTLER, B.A., King's College; M.A., Xavier College; Ph.D., University of Tennessee

The Office of Research, USMA, a part of the special staff, is charged with the responsibility to plan and conduct research projects specifically directed by the Superintendent and to coordinate and support all other research conducted by agencies of the United States Military Academy. Of great importance to the office is the systematic program of long range theoretical and applied studies related to the selection and performance of cadets and follow-up studies of graduates. The program includes an appraisal of the new cadets admitted each year in terms of their values, interests, motivation and commitment to a military career. In addition, the impact of the United States Military Academy activities and programs on cadet characteristics and behavior is also assessed with particular emphasis on changes in opinions, attitudes and interests over the four-year period. The office also conducts smaller applied research studies into specific areas of inquiry and answers specific questions.

The Office of Research provides certain services in support of other USMA offices. These include maintaining a central library of research accomplished at the United States Military Academy, and acting as a clearing house for research information. The Office is charged also with maintaining a central data file of information regarding candidates, cadets and graduates.



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 of Admissions

LTC. ROCCO F. VENTRELLA, B.S., United States Military Academy; M.A.,
Western Michigan University

Assistant Directors of Admissions

Candidate Advisory Services

LTC. WILLIAM K. SCHRAGE, JR., B.S., United States Military Academy;
M.A., Columbia University

Records and Data Processing

MAJ. JOHN C. WINKLER, B.S., United States Military Academy; M.B.A.,
University of Georgia

Field Support Programs

MAJ. ROBERT B. TURNBULL, (Ret.), B.S., United States Military Academy

Admissions Officers

MAJ. PHILIP Y. BROWNING, B.S., United States Military Academy

MAJ. EDWARD M. CROWLEY, B.S., United States Military Academy; M.B.A.,
Columbia University

MAJ. CORNELL McCULLOM, B.S., United States Military Academy; M.S.,
University of Utah

MAJ. THOMAS K. MERCER, B.S., United States Military Academy; M.Ed.,
University of Illinois

CPT. ARTHUR C. HESTER, B.S., United States Military Academy; M.A., Stan-
ford University

CPT. FRANKLIN P. LAMBERT, B.S., United States Military Academy; M.Ed.,
University of Illinois

CPT. HENRY MORRIS, B.S., United States Military Academy

2LT. ROBERT F. HIGGINS, B.A., M.B.A., Harvard University

ADMISSIONS PROCEDURE GUIDE

All prospective candidates should read carefully the material contained in the Admissions section of this catalogue. As a general guide, the following sequence is provided to assist prospective candidates.

1. Check the eligibility requirements listed on page 145 to see if you can qualify.

2. Study the nominating categories described on pages 150 thru 156. Determine which categories apply to you. Using the appropriate format on page 152 and 156 apply for a nomination under each category in which you are eligible.

3. If you are at least a High School Junior, complete a Prospective Candidate Questionnaire (USMA Form 21-1). Forward it to the Admissions Office so that a prospective candidate admissions file may be initiated for you.

4. Arrange for and complete the required College Board Tests (SAT, English Composition and Mathematics Achievement), following the procedure outlined on page 147.

5. Upon receipt of a nomination arrange for and complete a qualifying Medical Examination at one of the military facilities listed on page 184.

6. Upon receipt of instructions from the Admissions Office, West Point, proceed to one of the designated West Point Candidate Test Sites listed on page 161 and complete the Physical Aptitude Examination. You may also complete the qualifying Medical Examination at this test site if you have not already done so.

7. Insure that all forms received from the Military Academy Admissions Office and The Adjutant General, Department of the Army, are completed and returned promptly.

8. After completing all examinations and requirements, await notification of your admissions status.

9. In the event that you are not selected for admission, you may be considered for attendance at the United States Military Academy Preparatory School by requesting this in writing from the Director of Admissions, West Point, New York 10996, prior to 1 May 1971. Yearly, approximately 100 candidates are enlisted into the Army for attendance at the Preparatory School. Detailed information about the Preparatory School may be found on page 159.

ENTRANCE REQUIREMENTS

In order to qualify for admission you must be qualified academically, medically, and in physical aptitude. Additionally, you must meet certain basic 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 tour of obligated service.

QUALIFICATION

Academic Qualification

A candidate's academic qualification is determined by consideration of:

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 the following College Entrance Examination Board tests:

Scholastic Aptitude Test

English Composition Achievement Test

Level I or II Mathematics Achievement 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 on the scores because of any possible difference in the degree of difficulty of the two tests.

College Board Tests

All candidates for admission to West Point are required to take the Scholastic Aptitude Test, the English Composition and the Mathematics Achievement Tests (Level I or II) of the College Entrance Examination Board. It is not necessary to take all of the required tests at one time.

You should take:

The Scholastic Aptitude Test on 7 November 1970, 5 December 1970 or 9 January 1971. You may substitute the results of tests taken in the junior year, but you are urged to submit senior year test results.

The English Composition and Mathematics Achievement Tests (Level I or II) on 5 December 1970 or 9 January 1971. Junior year Achievement Test results may be used, particularly when a subject was terminated in the eleventh grade (for example — mathematics).

The final date for taking the College Board Tests for West Point is 9 January 1971. Exceptions may be made if extenuating circumstances preclude completion of the test series by the January date, write Admissions, West Point, New York 10996, explaining the circumstances and stating your intentions for completing the College Board requirements.

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 farther west, you should apply to the College Entrance Examination Board, Box 1025, 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: for the Scholastic Aptitude Test, \$5.75; for the two Achievement Tests, \$8.75. All applications and fees should reach the office of the College Board not later than the dates specified below:

7 October 1970 for tests given on 7 November 1970

4 November 1970 for tests given on 5 December 1970

9 December 1970 for tests given on 9 January 1971

Applications received after these dates will be subject to a penalty fee of \$3.00 *It is the candidate's responsibility to assure that the College Board forwards his test results to West Point. The college code number for West Point is R2924.*

Physical Aptitude Qualification

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, speed, and agility. It is given at the West Point Candidate Test Sites in November, January, February and March.

Qualification is determined on the basis of total performance in five or six physical performance tests (see examples on page 174). A poor performance on a single test will not necessarily result in disqualification.

A candidate who has qualified in physical aptitude in previous years is not required to reestablish his qualification during the current year. However, a candidate is advised to retake the test, since 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 only acceptable substitute for the West Point Physical Aptitude Examination is the Physical Aptitude Examination administered by the U.S. Air Force Academy. *It is the candidate's responsibility to have the results of the Air Force Academy examination forwarded to the Director of Admissions at West Point.*

Medical Qualification

Every candidate, regardless of the type or source of his nomination, must undergo a qualifying medical examination during the twelve months preceding 1 July 1971. This examination may be scheduled by the candidate at one of the authorized medical facilities listed in Appendix .. at any time following receipt of his nomination or he may take the examination at the same time he reports for the physical aptitude examination. Regardless of the number of nominations a candidate receives, he need take the medical examination only once. Qualification, or unacceptability, determined by that examination will stand for all nominations held. A General Outline of Medical Consideration is also found in Appendix G, page 175.

Procedures

As soon as possible after receipt of his letter of nomination the candidate is encouraged to make arrangements with the nearest Authorized Medical Testing Facility (Army hospital preferred) to take the medical examination. To do this he should contact the hospital Physical Examining Section, in writing, requesting an appointment to take the **QUALIFYING MEDICAL EXAMINATION** for candidates to the Military Academy. Travel and personal expenses incurred in taking the examination are the responsibility of the candidate. When the examination is completed all forms and records will be sent by the Examining Facility to The Surgeon General, Department of the Army, for evaluation. **NOTE:** The examining facility does not have the authority to make a qualification determination on any candidate for the Military Academy. Several weeks following the date of examination, the candidate should receive notification of the results from The Adjutant General, Department of the Army.

Evaluation

Final qualification is determined by The Surgeon General, as announced by The Adjutant General. If a candidate is found disqualified due to a non-remediable condition, no further testing as a candidate for the Military Academy will be authorized. If the disqualification is determined remediable, he will be notified by The Adjutant General, Department of the Army, of the corrective measures he must take in order to be reexamined. All inquiries pertaining to final medical qualification should be directed to The Adjutant General, Department of the Army, ATTN: AGPB-M, Washington, D.C. 20314.

EXCHANGE OF MEDICAL EXAMINATION RESULTS AMONG THE MILITARY SERVICES

The medical examinations for West Point, the Naval Academy and the Air Force Academy are the same, although the standards differ somewhat due to the commissioning requirements of the services. The Army will provide medical examination results to the Navy or the Air Force if a candidate for appointment to West Point also becomes a candidate for appointment to the Naval Academy or the Air Force Academy. The records will be sent at the request of either the candidate or his Congressional sponsor. Should a candidate for the Naval Academy or the Air Force Academy desire to have his records considered under a West Point nomination, it is his responsibility to request that the Navy or the Air Force send his records to the Surgeon

General, Department of the Army. The addresses of the reviewing offices of the three services are:

- For the Army: The Surgeon General
 Department of the Army
 ATTN: MEDPS-SP
 Washington, D.C. 20314
- For the Navy: The Board of Medical Examiners
 U.S. Naval Academy
 Annapolis, Maryland 21400
- For the Air Force: The Director of Physical Standards
 U.S. Air Force Academy
 Colorado Springs, Colorado 80840

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 Mayor of 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 Mayor of 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.*

FORMAT

Request for Congressional Nomination

Date _____

Honorable _____

Honorable _____

House of Representatives

United States Senate

OR

Washington, D.C. 20515

Washington, D.C. 20510

Dear Mr. _____

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 1971.

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 CADETSHIPS

The Secretary of the Army's annual allocation of cadetships is distributed to specific categories below for the class entering in July.

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.

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, ATTN: AGPB-M, Department of the Army, Washington, D.C. 20314, no later than 1 November.

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 held 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 Headquarters, Department of the Army, ATTN: AGPB-M, Washington, D.C. 20314; or by writing to Admissions, 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 held 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 Headquarters, Department of the Army, ATTN: AGPB-M, Washington, D.C. 20314; or by writing to Admissions, West Point, N. Y. 10996.

Sons of Deceased and Disabled Veterans

Cadetships are provided for the sons of deceased Armed Forces personnel who were either 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 contracted in active service, or pre-existing injury or disease aggravated by active service. 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, ATTN: AGPB-M, Headquarters, Department of the Army, Washington, D.C. 20314. Application must be made prior to 1 November. 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 or details of disability, as appropriate. The claim number assigned to the veteran parent's case by the Veterans Administration must also be furnished.

Honor Military/Honor Naval Schools and Army ROTC

Cadetships are provided annually for graduates of Honor Military and Honor Naval schools. Each such school, designated as an honor school by annual Department of the Army or Department of the Navy inspections, is invited to nominate three candidates annually from among its honor graduates. The cadetships will be filled by selecting the best qualified candidates regardless of the school from which nominated. The candidates need not be members of the graduating class of the current year, but in each instance the head of the school must certify that the candidate (1) has been a member of the ROTC units at least two years; (2) has been, or is to be graduated within the upper third of his class; (3) has demonstrated that in his academic, extracurricular, and ROTC activities he possesses outstanding qualities of leadership, character and aptitude for the Military Serv-

ice; (4) has met all other requirements of law and regulations prescribed for admission to the Military Academy. Honor School nominations must be received by The Adjutant General, ATTN: AGPB-M, Headquarters, Department of the Army, Washington, D.C. 20314, before 1 November.

Army ROTC: Members of college and high school Army Reserve Officer Training Corps units are eligible for nominations. For details, write Admissions, West Point, New York 10996.

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, ATTN: AGPB-M, Headquarters, Department of the Army, 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.

FORMAT

Request for Service Connected Nomination

Date _____

The Adjutant General
Department of the Army
ATTN: AGPB-M
Washington, D. C. 20315

Dear Sir:

I request a nomination under the _____ category for the class entering the United States Military Academy in July 1971 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.)

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 by the Adjutant General as soon as the Surgeon General, US Army, completes the evaluation.

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 the Admissions Office in writing and should complete all testing by 5 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.

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 1 July.

PREPARATION

Academic Preparation

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 College Entrance Examination Board tests. Above average grades in secondary-school subjects, and on the College Board tests, obviously will enhance a candidate's chances for admission.

In order to prepare adequately for the required College Board 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 Preparation

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 have attained a high state of physical conditioning prior to entering West Point.

Leadership Preparation

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 contribution 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 can also demonstrate leadership potential, which is normally revealed through the personal evaluations provided by school officials. In the West Point admissions procedure this candidate is not penalized because he cannot participate in extra-curricular activities.

USMA PREPARATORY SCHOOL

The Preparatory School is operated by the U.S. Army at Fort Belvoir, Virginia. Enlisted men on active duty wishing to compete for appointment to the Military Academy may be assigned for intensive academic, physical and military training to prepare them for competitive appointments and their initial year at the Academy. The entrance requirements for the Preparatory School closely parallel those of USMA. All applicants must satisfy minimum academic and medical standards as outlined in AR 351-12 before transfer to the Preparatory School is authorized, and all must either be nominated, or eligible to compete, for admission to the Military Academy. Approved applicants pay no tuition, are members of the service, retain rank held at time of entrance to USMAPS, receive normal military pay and allowances, and are subject to the Uniform Code of Military Justice.

The training course runs from mid-August through May and enrollment at the start of the course is a primary requirement. The academic program includes a comprehensive review of all high school English and Mathematics and an introduction to college level instruction in English and Mathematics. During the school year a physical training and extensive sports program conditions the student for the West Point Physical Aptitude Examination and for the rigorous life at the Academy. The military program encompasses all of the student's day-to-day activity other than academic instruction by emphasizing training in leadership, discipline, and fundamental military skills.

Attendance at USMAPS is mandatory for all applicants competing for Regular Army appointments. Qualified enlisted reservists and others may be selected for attendance at the Preparatory School upon application. Detailed information concerning application, selection and training at USMAPS may be obtained by writing directly to the Commandant, USMAPS, Fort Belvoir, Virginia 22060.

Attendance at the Preparatory School is unquestionably a sure route to follow to West Point. For example, of 155 civilians who enlisted into the Active Army to attend USMAPS in 1969, 130 of them entered the Academy as cadets the following year — an 84% rate of success.

Reserve component personnel not on active duty, interested civilians, and members of other services should write to The Adjutant General, ATTN: AGPB-M, Department of the Army, Washington, D.C. 20314. General information reference the Preparatory School may be secured by forwarding a letter of inquiry to the Commandant, USMAPS.

CANDIDATE TEST SITES

The qualifying medical examination and the Physical Aptitude Examination will be administered at the military installations listed on the following page on:

22-24 November 1970

10-12 January 1971

14-16 February 1971

14-16 March 1971

Candidates will be informed of their specific test dates and test site by the West Point Admissions Office. Subsequent instructions may be received from the test site West Point Candidate Examining Board President. Additional test dates may be scheduled, if needed.

WEST POINT CANDIDATE TEST SITES

*ALASKA Fort Richardson	LOUISIANA Fort Polk	OKLAHOMA Fort Sill
ARIZONA Fort Huachuca	MARYLAND Fort Meade	PENNSYLVANIA Carlisle Barracks Valley Forge
CALIFORNIA Fort MacArthur March AFB Presidio of San Francisco	MASSACHUSETTS Fort Devens	SOUTH CAROLINA Fort Jackson
COLORADO Fitzsimons GH	MISSISSIPPI Keesler AFB	SOUTH DAKOTA Ellsworth AFB
FLORIDA MacDill AFB	MISSOURI Fort Leonard Wood	TEXAS Fort Sam Houston Wm. Beaumont GH
GEORGIA Fort Benning Fort McPherson	MONTANA Malmstrom AFB	UTAH Hill AFB
*HAWAII Tripler GH	NEBRASKA Offutt AFB	VIRGINIA Fort Belvoir
IDAHO Mountain Home AFB	NEW JERSEY Fort Dix	WASHINGTON Fort Lewis
ILLINOIS Chanute AFB Fort Sheridan Scott AFB	NEW YORK Griffiss AFB West Point	*CANAL ZONE Fort Clayton
INDIANA Fort Benjamin Harrison	NORTH CAROLINA Fort Bragg	*GERMANY USAH, Heidelberg
KANSAS Fort Leavenworth	NORTH DAKOTA Grand Forks AFB Minot AFB	*JAPAN Camp Zama
KENTUCKY Fort Campbell Fort Knox	OHIO Lockbourne AFB Wright-Patterson AFB	*PUERTO RICO Fort Brooke

*Examinations will be administered during the January and March test dates only.

AFB -- Air Force Base

GH -- General Hospital

USAH -- U.S. Army Hospital

CRITICAL DATES FOR CANDIDATES

March 1970 - February 1971	Request nomination from authorized sources. Write Admissions, USMA, for file initiation.
1 July 1970	Candidates may begin taking Medical Exams which will be valid for a year.
July 1970 - January 1971	Receives nomination.
7 November 1970	College Entrance Examination Board Testing (SAT only).
5 December 1970	College Entrance Examination Board Testing.
22-24 November 1970	USMA Candidate Testing (Medical & PAE).
9 January 1971	College Entrance Examination Board Testing.
10-12 January 1971	USMA Candidate Testing (Medical & PAE).
14-16 February 1971	USMA Candidate Testing (Medical & PAE).
6 March 1971	College Entrance Examination Board Testing (Make-Up).
14-16 March 1971	USMA Candidate Testing (Medical & PAE).
*April 1971	Candidate Appointment (Offer of Admission to Selected Candidates).
1 July 1971	New Fourth Class Enter (Class of 1975).

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



	<i>Page</i>	
	<i>Appendix</i>	
THE HONOR CODE	A	165
BOARD OF VISITORS	B	166
ASSOCIATION OF GRADUATES	C	168
THE ALUMNI FOUNDATION	D	171
ACADEMY FACILITIES	E	172
THE PHYSICAL APTITUDE EXAMINATION	F	174
MEDICAL QUALIFICATION AND EXAMINATION FACILITIES	G	175
WEST POINT MAP	H	188
STAFF AND FACULTY ALPHABETICAL ROSTER	I	189
INDEX	J	208

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, shortly 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. 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 take no advantage of this privilege. 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.

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 semiannual 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 1970

From the United States Senate

Honorable HOWARD W. CANNON, Nevada (representing the
Chairman, Senate Armed Services Committee)

Honorable ERNEST F. HOLLINGS, South Carolina

Honorable GALE W. McGEE, Wyoming

Honorable JAMES B. PEARSON, Kansas

From the United States House of Representatives

Honorable WILLIAM NICHOLS, Alabama (representing the
Chairman, House Armed Services Committee)

Honorable GLENN R. DAVIS, Wisconsin

Honorable MARTIN B. McKNEALLY, New York

Honorable WILLIAM H. NATCHER, Kentucky

Honorable OLIN E. TEAGUE, Texas

Appointed by the President of the United States

Mr. ROBERT M. BRUNSON, Executive Vice-President,
E. F. MacDonald Company, Beverly Hills, California

Mr. JERRY FINKELSTEIN, Chairman of the Board, Struthers
Wells Corporation, New York

Mr. EDWIN D. ETHERINGTON, Old Lyne, Connecticut

*Major General LEIF J. SVERDRUP, USAR (Ret) Chairman of
the Board, Sverdrup & Parcel & Associates, Inc.,
St. Louis, Missouri

Mr. LOUIS R. VINCENTI, President, Mutual Savings and Loan
Association, Pasadena, California

*Elected Chairman of the 1970 Board.

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 21,053 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 there-to 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 depos-

ited to the principal of that fund and remain there for investment purposes. Funds invested by the Endowment Fund work for 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, has proved quite successful and as it is now the scheduled reunion period for the more junior classes, it affords the alumni a second annual opportunity to visit their Alma Mater and renew old acquaintances. In addition to the football game, there are a Thayer monument ceremony and a review in honor of the alumni by the Corps of Cadets.

Founders Day, 16 March, is celebrated at West Point and at nearly 150 other places throughout the world. These celebrations traditionally include a dinner, attended by all alumni within commuting distance, and speeches by the oldest and youngest graduates present. The Association of Graduates supports these annual celebrations in many ways.

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, and Ellsworth Bunker in 1970.

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 con-

cerning 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 and 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 five 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)

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 Society of West Point

New Jersey

Central Jersey (Fort Monmouth)
(Fort Monmouth)

New Mexico

Albuquerque

New York

New York (New York City)
 Mid-Hudson Valley (West Point)
 Rochester
 Western New York (Buffalo)
 Capital District (Albany)

North Carolina

Western North Carolina (Asheville)
 Piedmont (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

Tennessee

Tennessee (Nashville)

Texas

Central Texas (Austin)
 El Paso Area
 Houston
 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.

ACADEMY FACILITIES

The military reservation consists of over 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 on the 2500 acre West Point Post. The main cadet complex

retains the harmonious blend of Gothic style architecture and the natural beauty of the surrounding hills.

Flanking Washington Hall, the cadet dining hall, is the barracks complex which houses the 4100 man Corps of Cadets. New barracks under construction will provide additional two man rooms as the Corps expands to a total strength of 4400 men. In addition to the cadet dining hall, Washington Hall contains the Cadet Headquarters, offices of the Commandant and his staff, and classroom facilities.

Thayer and Bartlett Halls, adjacent to the cadet barracks complex, contain most of the academic departments, classrooms and laboratory facilities. Thayer Hall, a completely new structure built within the walls of the old riding hall, encompasses 98 classrooms, a computer center, a television studio, two 200 seat map problem rooms, 800 and 1500 seat auditoriums, laboratories, the Academy museum and offices for academic departments. A nine story science building presently under construction will complete the academic facilities required for the increasing number of cadets.

The cadet library, containing 300,000 volumes, reading rooms, seminar rooms, microfilm and audio visual facilities, and rare book collections, is adjacent to the academic and barracks complexes.

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

West Point provides the cadets with outstanding athletic facilities. The gymnasium building actually houses four 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 structures of Michie Stadium for football, Shea Stadium for track, Doubleday Field for baseball and Smith Rink for ice hockey, 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 nearby ski jump is restricted to West Point Ski Team members and visiting competitors. 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 pipe organ in the Western Hemisphere, dominates the cadet barracks complex and is 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 and for funeral services.

Cadets have numerous clubs and activities for leisure time. Each class has a class club within or near the barracks complex. Grant Hall, Cullum Hall and The Compound provide facilities for cadets and their guests. The Government owned Hotel Thayer, near Thayer Gate, provides hotel accommodations for the Cadets' friends and families.

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 Highland setting. Visitors are urged to begin their tour at the Visitors Information Center near Thayer Gate where informative literature and suggested tour guidance are available.

THE PHYSICAL APTITUDE EXAMINATION

A combination of the following tests, which result in the candidate using all of his physical facilities, constitutes the Physical Aptitude Examination of the Military Academy.

1. Medicine Ball Put. Put a six pound medicine ball for distance using the same movement as required for a shot put.
2. Chinups. From the arm hang position on a horizontal bar, palms toward the face, elevate the body until the chin is above the bar.
3. Pullups. Same as chinups except palms away from the face.
4. Situps. Perform as many situps as possible in two minutes.
5. Hurdle Run, Zig Zag Run, and Dodge Run. Run through a maze of hurdles on a gymnasium floor for time.
6. Shuttle Run. Run between two lines, 25 yards apart, to cover distances from 100 to 400 yards.
7. Squat Thrust. Continuous movements for 20 seconds from the standing position to the squat, to the leaning rest, to the squat, and back to the standing position.
8. Vertical Jump. Jump for height.
9. Standing Broad Jump. One jump for distance.
10. Three Broad Jumps. Three continuous broad jumps for distance.

11. Rope Climb. Climb a regular gymnasium rope as high as possible in seven seconds using hands and feet or hands alone, starting from a standing position.
12. Instep Touch. From the arm hang position on a horizontal bar, bring the insteps up to touch the bar.
13. Hop, Step and Jump. With a ten foot start to the takeoff line, take a hop, a step, and a jump in a continuous movement for distance.
14. Basketball Throw. Throw a regulation basketball for distance from either a standing or kneeling position.
15. Basketball Pass. Pass a basketball against a wall for speed and accuracy.
16. Block Shuttle Run. In a shuttle run, pick up blocks and place them on designated spots.
17. Dips. Raising and lowering oneself on parallel bars with the arms.
18. Pushups. Standard pushups starting from the leaning rest position.

MEDICAL STANDARDS

Medical Examination and Disqualifications

The 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 overseas 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 July of the year preceding the year of admission. Examinations taken prior to 1 July of the year preceding the year of admissions are acceptable only as preliminary examinations, therefore an applicant is required to complete another medical examination should he receive another formal nomination. The applicant must contact the medical facility and request an appointment to have the *qualifying medical examination*. Facilities authorized to conduct qualifying medical examinations are listed at the end of this Appendix.

Review Procedures

The results of all medical examinations are subject to review by the medical departments of the appropriate service. The reviewing authority for the U.S. Military Academy is The Surgeon General, Department of the Army. Within eight weeks following medical

examination, the candidate should receive notification of the results. All inquiries pertaining to final medical qualification should be directed to The Adjutant General, Department of the Army, ATTN: AGPB—M, Washington, D.C. 20314.

The Navy and Air Force Academies are the reviewing authorities for their respective services. Medical qualification decisions made by the reviewing authorities are 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 waived. 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 waived. 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. Standards of weight according to height are as follows:

<i>Height (Inches)</i>	<i>U.S. Military and U.S. Naval Academies</i>		<i>U.S. Air Force Academy</i>	
	<i>Minimum</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Maximum</i>
64 (A) (C)	105	183	113	159
65 (A) (C)	106	187	115	163
66 (B)	107	191	117	166
67	111	196	121	171
68	115	202	125	176
69	119	208	127	191
70	123	214	131	197
71	127	219	135	202
72	131	225	139	208
73	135	231	143	215
74	139	237	147	219
75	143	243	151	224
76	147	248	155	229
77	151	254	159	235
78	153	260	162	240
79 (C)	159	266	169	245
80 (B) (C)	166	273	173	250

- (A) USMA — 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 Headquarters, Department of the Army, during the processing of their cases provided they have exceptional educational qualification, outstanding military record, or demonstrated outstanding abilities.
- (B) USAFA — Minimal height is 66". Maximum is 80". On the recommendation of the Superintendent, USAFA, these standards may be waived.
- (C) USNA — Waiver for height up to 80" may be granted to a limited number of candidates with exceptional scholastic and leadership achievements.

Eyes and Vision Disqualifications

USMA	USNA	USAFA*
VISION		
Any visual acuity must correct to 20/20 with glasses (See refractive error).	Uncorrected vision exceeding 20/20 each eye.	Uncorrected vision exceeding 20/20 each eye (See refractive error).
*Uncorrected far visual acuity up to 20/50 each eye which corrects to 20/20 with lenses will be considered qualifying for flying other than pilot.		

MUSCLE BALANCE

- | | | |
|--|-----------------|--|
| 1. <i>Esophoria</i> over 15 prism diopters. | Not Applicable. | <i>Esophoria</i> over 10 prism diopters. |
| 2. <i>Exophoria</i> over 10 prism diopters. |do..... | <i>Exophoria</i> over 5 prism diopters. |
| 3. <i>Hyperphoria</i> over 2 prism diopters. |do..... | <i>Hyperphoria</i> over 1 prism diopter. |
| 4. Strabismus (Tropia) disqualifying for all candidates. | | |

COLOR VISION

- | | | |
|--|--------------------------|--------------------------|
| Must be able to distinguish vivid red and vivid green. | Normal color perception. | Normal color perception. |
|--|--------------------------|--------------------------|

CYCLOPLEGIC REFRACTION

- | | | |
|-----------------|-----------------|-----------------|
| All candidates. | All candidates. | All candidates. |
|-----------------|-----------------|-----------------|

REFRACTIVE ERROR

- | | | |
|--|--|---|
| 1. MYOPIA
Exceeding -5.50 diopters in any meridian. | Exceeding -4.50 diopters spherical equivalent. | Exceeding -5.50 diopters in any meridian. |
| 2. HYPEROPIA
Exceeding +5.50 diopters in any meridian. | Exceeding +4.50 diopters spherical equivalent. | Exceeding +5.50 diopters in any meridian. |
| 3. ASTIGMATISM
Exceeding + or -3.00 diopters. | Exceeding + or -3.00 diopters. | Exceeding + or -.75 diopters. |
| 4. ANISOMETROPIA
Exceeding 3.50 diopters. | Exceeding 3.50 diopters. | Exceeding 3.50 diopters. |

CONTACT LENSES

Removed 72 hours prior to examination.

Removed 72 hours prior to examination.

Removed 72 hours prior to examination.

WAIVER

None allowed.

20/100 vision corrected to 20/20 and exceptional scholastic and leadership achievement.

Visual acuity not exceeding 20/200 correctible to 20/20 and outstanding academic or leadership achievement.

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 °° °°°	° °°	° °° °°°

°U.S. MILITARY ACADEMY — Not standardized or no requirement.

°°AIR FORCE ACADEMY — 3000, 4000, and 6000 frequency range will be tested. A total of 260 decibels or greater for the six thresholds in these ranges is disqualifying.

°°°NAVAL ACADEMY — Hearing loss greater than 45 decibels at the 3000 frequency is disqualifying. Record the 4000 and 8000 frequencies for base line only.

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 in past 5 years. Pneumothorax regardless of etiology or history thereof is disqualifying for the U.S. Military Academy. Spontaneous pneumothorax within past 3 years or history of repeated episodes is disqualifying for the Air Force and Naval Academies. Chronic bronchitis, bronchiectasis. Congenital malformations that result in reduced chest capacity with associated diminution of respiratory reserve, absence of the clavicle, ununited fractures of the clavicle that would interfere with carrying military equipment. Coccidioidomycosis unless healed without residual.

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. History of pilonidal cystectomy within the two years previous to examination is also disqualifying for the Air Force and Naval Academies. 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. Phimosi, epispadias, or pronounced hypospadias 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. 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 (bed-wetting) 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. Diabetes mellitus or history of diabetes mellitus in both parents is disqualifying for the Air Force and Naval Academies. 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. Carious teeth which are unfilled or improperly filled or restored.
 - b. Grossly disfiguring spacing of anterior teeth.
3. Appliances:
- a. Prosthetic appliances below standards of design, construction and tissue adaption.
 - b. Lower prosthetic appliance which is not retained or adequately stabilized by sufficient serviceable natural teeth.
 - c. Orthodontic appliances attached to the teeth for continued treatment (retainer appliances are acceptable).



MEDICAL EXAMINATION FACILITIES

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Fort Rucker
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U.S. Naval Air Station, Adak
U.S. Naval Air Station, Kodiak

ARIZONA

Davis-Monthan Air Force Base
Fort Huachuca
Williams Air Force Base

ARKANSAS

Blytheville Air Force Base
Little Rock Air Force Base

CALIFORNIA

Beale Air Force Base
Castle Air Force Base
Edwards Air Force Base
Fort Ord
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Hamilton Air Force Base
Letterman General Hospital
March Air Force Base
Mather Air Force Base
McClellan Air Force Base
Travis Air Force Base
U.S. Naval Air Station, Alameda
Naval Hospital, Camp Pendleton
Naval Air Station, El Centro
Naval Air Station, Ream Field
Lemoore Naval Hospital
Naval Hospital, Long Beach
Naval Air Station, Moffett Field
NALF, Monterey
Naval Hospital, Oakland
Naval Missile Center, Point Mugu
Marine Corps Air Station, Santa Ana
Naval Hospital, San Diego
Naval Air Station, North Island, San Diego
Naval Air Station, Miramar, San Diego
U.S. Marine Corp Air Station, El Toro
Vandenberg Air Force Base

COLORADO

Fitzsimons General Hospital
Lowry Air Force Base
U.S. Air Force Academy

DELAWARE

Dover Air Force Base

DISTRICT OF COLUMBIA

Walter Reed General Hospital

FLORIDA

Eglin Air Force Base
Homestead Air Force Base
MacDill Air Force Base

Tyndall Air Force Base
Naval Hospital, Jacksonville
Naval Air Facility, Jacksonville
Naval Hospital, Key West
Naval Hospital, Pensacola
Naval Hospital, Orlando

GEORGIA

Fort Benning
Fort Gordon, Goovetown
Fort McPherson
Fort Stewart
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Robins Air Force Base
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Naval Air Station, Atlanta
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Hickam Air Force Base
Tripler General Hospital
Naval Air Station, Barbers Point

IDAHO

Mountain Home Air Force Base

ILLINOIS

Chanute Air Force Base
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Scott Air Force Base
Naval Hospital, Great Lakes
Naval Air Station, Glenview

INDIANA

Fort Benjamin Harrison
Grissom Air Force Base

KANSAS

Fort Leavenworth
Fort Riley
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KENTUCKY

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Otis Air Force Base
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Westover Air Force Base

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INDEX

- Academic Board 16
- Academic Program 14
- Academic Qualification 146
- Activities Section 126
- Administration 5
- Admissions 144
- Alumni Foundation 171
- Appointment Upon Graduation 112
- Aptitude for the Service 112
- Army Athletic Association 132
- Association of Graduates 168
- Board of Visitors 166
- Cadets, Corps 112
- Candidate Test Sites 160
- College Board Examinations 147
- Computer Center, Academic 28
- Corps of Cadets — Organization 112
- Counseling & Advising 122
- Courses, Elective 23
- Courses, Standard Academic
 - Program 18
- Dean, Office 27
- Departments, Academic 27
 - Chemistry 39
 - Earth, Space & Graphic Sciences 41
 - Electrical Engineering 47
 - Engineering 51
 - English 34
 - Foreign Languages 58
 - History 65
 - Law 69
 - Mathematics 71
 - Mechanics 80
 - Military Hygiene 84
 - Physics 85
 - Social Sciences 90
- Department of Tactics 115
 - Military Psychology & Leadership 96
 - Office of Military Instruction 115
 - Physical Education 31
- Educational Philosophy 15
- Extracurricular Activities 126
- Facilities, Academy 172
- Graduate Civil Schooling 102
- History of West Point 6
- Honor Code 165
- Instruction, Methods 21
- Lecture Program 104
- Library 99
- Map, West Point and Vicinity 188
- Medical Examination Facilities 184
- Medical Standards 175
- Military Program, Mission 110
- Mission of the Military Academy 4
- Museum 137
- Nominations 150
- Pay and Allowances 112
- Physical Aptitude Examination 174
- Preparation 158
- Preparatory School 159
- Programs, Academic 31
- Qualification 146
- Religious Activities 123
- Research, Office of 142
- Schedule, Typical Daily 114
- Scholarships 102
- Service Life 140
- Societies, West Point 170
- Staff and Faculty 189
- Validation 20



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