

## OFFICER EDUCATION

Military instruction began at Cornell University in 1868 under the provisions of the Morrill Act of 1862. Since that time, officer education has been highlighted by the construction of Barton Hall in 1914, establishment of a formal Reserve Officers Training Corps (ROTC) unit in 1916, and the evolution of a program that deemphasizes drill and formations and places greater stress on the development of leadership and managerial skills. Throughout the years Cornell's program of officer education has provided many outstanding civilian and military leaders well equipped for success as a result of knowledge and skills gained from their involvement in the Officer Education Program while pursuing undergraduate and graduate degrees.

The programs of officer education allow the student to prepare for a commission as an officer in either the United States Army, Navy, Marines, or Air Force. Each service program is headed by a senior military officer who also serves as a full professor on the Cornell faculty.

### MILITARY SCIENCE

Lieutenant Colonel Robert N. D'Entremont, Quartermaster Corps, United States Army, Professor of Military Science and Commanding Officer, U.S. Army ROTC Instructor Group

Major Steven A. Barrows, Field Artillery, United States Army

Major Edward R. Murdough, Engineer Corps, United States Army Reserve

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### United States Army ROTC Program

The primary objective of the Army Officer Education Program at Cornell is to commission the officer leadership of the United States Army. Intermediate objectives are to provide students with an understanding of the fundamentals of responsibility, integrity, and self-discipline, as well as an appreciation of the citizen's role in national defense. The application of the decision-making process to a variety of situations is given major emphasis as a valuable aid in developing leadership potential.

These objectives are achieved through a program normally covering four years. A two-year program is available, however, and is discussed in a later section. The program includes specific courses in military science, more general academic subjects that assure a well-rounded education, practical training in leadership through participation in the Cadet Corps (including attendance at one six-week summer camp at an Army installation), and the opportunity to participate in a number of

extracurricular activities. The combination prepares the student for commissioning and effective performance in the many branches of the Army. The student's academic major, academic performance, leadership ability, and personal desires and the needs of the Army determine the branch of the Army in which he or she is commissioned upon graduation.

### Requirements for Enrolling

Applicants must be citizens of the United States (Noncitizens may enroll in selected portions of the program.)

An applicant's vision must be correctible to a minimum of 20/20 in one eye and 20/400 in the other eye. Height must be at least sixty inches for men, fifty-eight inches for women, and no more than eighty inches for men and seventy-two inches for women, although exceptions will be considered. The weight requirement varies according to age, height, and sex. Overall sound mental and physical condition is essential, and students are required to undergo periodic physical examinations. Enrollment in the program is subject to the approval of the professor of military science.

Enrollment in specific courses by students not formally enrolled in the program must be approved by course instructors.

### Four-Year Program

The Four-Year Program is open to students in their freshman year or, with the approval of military and university authorities, to sophomores in a five-year degree program. Veterans of the Armed Forces of the United States and students entering Cornell with AROTC credit from secondary or military schools (Junior Division AROTC) may receive advanced standing.

Under the Four-Year Program students enroll in the basic courses (Mil S I and II) during the first two years, and the advanced courses (Mil S III and IV) during the next two years. A total of fourteen credits of military subjects is taken. In addition, academic-enrichment courses are required in such fields as written communications, math, logic, computer science, human behavior, military history, and perhaps foreign languages. Specific requirements are determined by the student and his or her adviser after initial enrollment. Throughout the four years, cadets spend an additional two hours each week each semester in practical leadership training for which there is no academic credit. All cadets attend a six-week camp, with pay, between the junior and senior years.

### Basic Courses (Mil S I and Mil S II)

Students in the first year of the basic courses take one classroom course in military science in the fall and spring semesters, for which they receive academic credit. These courses include study of the U.S. organization for defense and principles and techniques of leadership and management.

Students also participate in leadership modules that include rappelling, orienteering, drill and ceremony, physical training, winter survival, and individual tactical training. These modules are designed to promote personal development and enrichment. While they do not receive academic credit for these activities, students receive physical education credit. Typical freshman participation in Army officer education is 48 1/2 program-related hours.

During the fall of the second year, the student takes a three-credit class in military history, including the evolution of warfare and armed conflict in society. In the spring, the student takes a one-credit course in map reading and spends approximately two hours a week in practical leadership training, land navigation, and military skills.

### Advanced Courses (Mil S III and Mil S IV)

The advanced courses of the Four-Year Program are open to students who have successfully completed the basic course and are accepted by the professor of military science for further enrollment. It is also open to students who have gained appropriate advanced standing through either successful completion of basic summer programs (see the description of the Two-Year Program) or prior military training. Any student entering the advanced courses must have two years of academic work remaining at Cornell or another degree-granting institution. The student must pass such physical and aptitude tests as may be prescribed. In addition, the past performance and desire of each student is evaluated to determine if he or she has the potential for eventual commissioning.

When students are accepted for the advanced course, they execute a written contract with the U.S. government. Under terms of the contract, they agree to complete the advanced course and to accept a commission if tendered. Concurrently with the signing of the contract, students enlist in the United States Army Reserve for control purposes.

Classroom study in the advanced course includes one military science course each semester on such subjects as leadership and management, small-unit tactics, and command and staff organization and functions. The two hours a week of practical leadership training continues, and between the junior and senior years all cadets attend a six-week advanced summer camp currently conducted at Fort Bragg, North Carolina.

### Two-Year Program

The Two-Year Program consists of the last two years (the advanced courses) of the regular Four-Year Program. To qualify for the Two-Year Program, a student must successfully complete a basic six-week summer camp or receive placement credit for prior military service.

The Two-Year Program is open to selected students who have two years of academic study remaining at Cornell or another accredited degree-granting institution.

Applications are accepted October to April of the sophomore year. Selectees complete the basic six-week camp before registering in the advanced courses the following fall. They must also meet specified physical requirements and execute the same written contract as those students who enter the advanced courses after completing the regular basic courses.

### Scholarships

Scholarships are awarded on the basis of merit and are available for two, three, or four years. AROTC scholarships are awarded each year to outstanding basic camp participants and students in the freshman and sophomore classes. Cadets who are awarded scholarships continue to receive support until graduation as long as they fulfill the requirements. Scholarship cadets receive a stipend for university tuition, required fees, required textbooks, and classroom materials for the duration of their scholarship. Scholarship cadets and advanced course cadets also receive \$100 a month for up to ten months a year.

### Commissioning

All students who successfully complete the advanced course, including the advanced summer camp, are commissioned as second lieutenants in the United States Army Reserve or the Regular Army upon graduation.

### Distinguished Military Graduates

Selected senior cadets with high academic achievement and outstanding military qualities are designated Distinguished Military Graduates after fulfilling all obligations for a baccalaureate degree. All cadets, scholarship and nonscholarship, are eligible to compete for this distinction.

### Service Obligations

A variety of active duty and reserve combinations are available. The manpower requirements of the Army and the qualifications of the cadets determine the option.

An officer beginning active duty first attends the Basic Officer Course (normally eight to twelve weeks) of the assigned branch. Upon completion of this course the officer is assigned to a unit and location that is determined by the desires of the individual and the requirements of the Army. Those officers selected for reserve duty attend the Officer Basic Course, after which they are released to reserve status.

Nonscholarship cadets accepting a Regular Army commission serve a minimum of three years on active duty followed by up to five years in reserve status.

Scholarship cadets, whether commissioned in the Regular Army or the Reserve, generally serve four years on active duty and four years in reserve status; however, some may serve eight years on reserve duty.

### Choice of Branch

Cadets in the second year of the advanced course (normally the senior year) may specify the branch of the Army—such as Infantry, Corps of Engineers, Armor, Signal Corps, Artillery, Air Defense, Ordnance, Chemical, Adjutant General, Quartermaster, Finance, Medical Service, Military Intelligence, Military Police—in which they prefer to serve. They are notified in the spring, before commission-

ing, of the branch to which they are assigned. The likelihood of appointment in a chosen branch depends upon the student's academic and officer education performance, degree area, and the needs of the Army at that time.

### Graduate Study

Active duty deferments, or educational delays, may be granted to individuals who want to attend graduate school at their own expense. Requests will be considered on the basis of needs of the service. Admission to graduate school is the student's responsibility.

### Benefits

Each cadet in the advanced courses (Mil S III and Mil S IV) receives \$100 a month for up to ten months a year. While attending the advanced summer camp (between the junior and senior years), each cadet receives approximately \$600 and an allowance for travel to and from camp. Each semester approximately \$180 is provided to cover textbooks, supplies, and fees for scholarship recipients.

A cadet in the Two-Year Program receives the same payments as cadets in the advanced course and, in addition, receives approximately \$700 and a travel allowance for basic summer camp attendance before entering the advanced course.

### Military Science Courses

All cadets take one course and a leadership laboratory each semester in military science. The number of hours a week spent in the classroom varies from semester to semester, as does the credit received for each course. Students in the Four-Year Program are required to take courses as noted below. Students in the Two-Year Program are required to take all of the courses listed for the junior and senior year and the military history course (Mil S 211).

#### Freshman Year (Mil S I)

##### Mil S 101 United States Organization for Defense

Fall. 1 credit. Required.  
Staff.

Students examine the U.S. defense apparatus in terms of organization, mission, personnel, and relationships among military forces and between the military forces and various branches and departments of the government. The United States Army force structure is examined at all levels. The complexities and magnitude of operating the defense organization are studied to provide a framework for subsequent instruction.

##### Mil S 102 Leadership Theory

Spring. 1 credit. Required.  
Staff.

This course allows students to develop a basic understanding and appreciation of the theories of social and organizational psychology and behavior as they apply to the military setting. Attention is given to leader types, the source and exercise of authority, and the impact of varying styles of leadership on motivation and organization effectiveness. The student is introduced to the concepts of integrity, ethics, and professionalism.

#### Sophomore Year (Mil S II)

##### Mil S 321 Armed Conflict and Society

Fall. 3 credits. Required.  
3 classes each week. Presentation by Army, Air Force, Marine Corps, and Navy instructors with guest lecturers, primarily from government and history departments. A study of modern warfare that examines the relationship of military strategy to geography, economics, sociology, technology, and national political realities and values; the evolution of warfare, including principles of war, weapons, and associated equipment; and the effects of nuclear weapons and guerrilla warfare on traditional concepts of national strategy.

##### Mil S 222 Mapping: Land Navigation

Spring. 1 credit. Required.  
Staff.

This course provides practical knowledge of the various forms of topographic representation. Students interpret and use maps in terrain association and land navigation. Knowledge of topography is complemented by an orientation on significant environmental influences from physical, social, and climatic factors. Portions of the course offer practical experience in land navigation and orienteering.

#### Junior Year (Mil S III)

##### Mil S 331 Theory and Dynamics of the Military Team

Fall. 2 credits. Required.  
Staff.

After an initial introduction to techniques of presenting briefings, students are provided with a broad understanding of the principles and application of teamwork in military organizations. Particular emphasis is given to leadership responsibilities of the commander as the team coordinator. Additionally, students have an opportunity to develop an understanding of the roles and contributions of the various branches of the Army in support of the military team.

##### Mil S 332 Leadership in Small-Unit Operations

Spring. 2 credits. Required.  
Staff.

This course provides an understanding of the nature of decision making and the tactical application of the military team. Through the use of conferences and extensive practical exercises, students develop familiarity with the factors influencing the leader's decisions; the processes of planning, coordinating, and directing the operations of military units to include troop-leading procedures; and development of operation plans and orders.

#### Senior Year (Mil S IV)

##### Mil S 441 Contemporary Military Environment I

Fall. 2 credits. Required.  
Staff.

An overview of the functions, responsibilities, and interrelationships between the small-unit leader, the commander, and the staff, using a combat arms battalion as a typical organizational structure. Detailed discussions focus on actions of the small-unit leader, communication skills, the military justice and legal system, the threat environment, and the logistical support of the army in the field.

**Mil S 442 Contemporary Military Environment II**

Spring. 2 credits. Required. Staff.

A continuation of Mil S 424. Students examine the leadership environment of the Army officer. Conferences and seminars examine the techniques of effective military leadership with special attention given to professionalism and ethical considerations in the armed forces during peacetime and armed conflict.

**Practical Leadership Training****All Army Officer-Education Students**

In the leadership laboratory, all of these objectives are accomplished by emphasizing practical exercises and firsthand experience. Types of practical laboratory activities include an introduction to rifle marksmanship, mountaineering, physical training, land navigation and orienteering, signal communications, tactics, and orientations and training exercises at military installations.

As with many laboratory periods, no credit is given, and participation is required for successful completion of the AROTC program. Students will receive physical education credit for the laboratory. Students register as follows:

**Mil S I Leadership Laboratory I**

<i>Fall</i>	<i>Spring</i>
Mil S 151	Mil S 152

Mil S I cadets select either rappelling-drill and physical training, or ranger training. In the spring, class choices are winter survival-land navigation or ranger training. These interesting and challenging activities do not provide academic credit but may be used for physical education credit if adequate hours have been accrued.

**Mil S II Leadership Laboratory II**

<i>Fall</i>	<i>Spring</i>
Mil S 251	Mil S 252

Cadets meet for two hours each week as members of the cadet organization to participate in practical leadership exercises. Types of practical activities include familiarization in rifle marksmanship, orienteering, drill and ceremonies, signal communications, physical fitness training, tactics and field exercises, and discussions.

**Mil S III Leadership Laboratory III**

<i>Fall</i>	<i>Spring</i>
Mil S 351	Mil S 352

Cadets meet for two hours a week to prepare for a six-week summer camp that follows the junior year. Emphasis is on the development of individual skills in leadership techniques and practical skills. Cadets rotate among leadership positions to develop an ability to apply decision-making processes to a myriad of situations. They also acquire technical expertise and proficiency in signal communications, physical fitness, drill and ceremonies, rappelling, orienteering, tactics, water survival, and other military skills. This also includes two to three hours a week devoted to physical fitness.

**Mil S IV Leadership Laboratory IV**

<i>Fall</i>	<i>Spring</i>
Mil S 451	Mil S 452

Senior cadets plan and operate the leadership laboratory programs for Mil S I-III cadets. The development of planning and supervisory skills is emphasized. Cadets have an opportunity to practice leadership skills developed during previous ROTC training and

summer camp experiences. This also includes two to three hours a week devoted to physical fitness.

**NAVAL SCIENCE**

Captain Edward W. Colbert, Jr., United States Navy, Professor of Naval Science and Commanding Officer, Naval ROTC Unit

Commander Dennis R. Kukulski, United States Navy

Major James M. Higgins, United States Marine Corps

Lieutenant Walter A. Powell, United States Navy

Lieutenant Steven LaPorte, United States Navy

Lieutenant John M. Fleming, United States Navy

The objective of the Naval Officer Education Program is to prepare selected students for service as commissioned officers in the United States Navy or United States Marine Corps by supplementing their undergraduate education with instruction in essential concepts of naval science and fostering development in the qualities of leadership, integrity, and dedication to their country and the naval services. The program is compatible with most undergraduate major fields of study, including five-year baccalaureate degree programs on a case-by-case basis.

The objective is achieved through a broad program, normally covering four years, that combines specific courses in naval science and specified academic subjects to supplement weekly professional development sessions in which the practical aspects of naval science and leadership procedures are stressed. It also includes at least one summer-at-sea period.

**Non-naval officer education students.**

Though the Navy-Marine Corps program has been designed to prepare future officers, Naval science courses are open to all students at Cornell University as space limitations allow.

**Requirements for Enrollment**

An applicant for Naval ROTC at Cornell must be a citizen of the United States. Applicants must have reached their seventeenth birthday by June 30 of the entering year and be less than twenty-five years of age on June 30 of the calendar year in which they are commissioned. Waivers of the upper age limit may be available for applicants who have prior active duty military service. Applicants must also meet physical and medical requirements. Interested students should visit the Naval ROTC Unit in Barton Hall.

**Programs**

There are two types of Naval programs: the Scholarship Program and the College Program. They differ primarily in benefits to the student and type of commission earned.

**Scholarship Program**

The Naval Officer Education Program provides approximately seventy-eight hundred scholarships in over sixty-five universities nationwide to selected students who want to serve in the Navy or Marine Corps. Financial support is provided students during college preceding the award of the baccalaureate degree.

**Benefits**

The program provides uniforms, full tuition, most instructional fees, textbooks, nonconsumable supplies, and \$100 a month for a maximum of forty months.

Successful completion of the Scholarship Program leads to a regular commission in the Navy or Marine Corps. At Cornell University over 90 percent of NROTC students have a scholarship. Students entering NROTC without a scholarship are entitled to compete for one-, two-, or three-year scholarships controlled by the Chief of Naval Education and Training.

**Entering the Scholarship Program**

There are three ways to enter the Scholarship Program:

*First*, by applying for the national competition each year. This entails filling out and sending an appropriate application; being interviewed; having a physical examination; and applying to, and being accepted by, one of the colleges or universities throughout the country that offers an NROTC program.

*Second*, by enrolling in the College Program at Cornell and being recommended by the professor of naval science for a scholarship after at least one semester in the program.

*Third*, by entering through the Two-Year Scholarship Program.

**College Programs**

There are two College Programs available. Both lead to a commission in the Naval or Marine Corps Reserve and three years of active duty.

Each of these programs provides textbooks for naval professional courses, uniforms, and a subsistence allowance of \$100 a month from the beginning of the junior year.

The regular College Program is three to four years long. Academic requirements for students in this program are somewhat less than those for scholarship students, as noted in the curriculum section of this booklet.

The Two-Year College Program begins the summer before the junior year, when students attend a required program with pay at the Naval Science Institute in Newport, Rhode Island.

**Summer Training**

Each summer, students in the Scholarship Program spend approximately four to six weeks on a Navy ship, the unit sail-training vessel *Vindicator*, or with a naval activity anywhere in the world for on-the-job training. College Program students attend one summer training session of the same duration between the junior and senior years. While attending summer training sessions, midshipmen are paid approximately \$500 a month.

## Active Duty Requirements

As required by Section 2107, Title 10, United States Code, selected applicants must enlist in the United States Naval Reserve for eight years in pay grade E-1 (seamen recruit) before being appointed midshipman, USNR, and receiving compensation. Students who are disenrolled from the NROTC Scholarship Program for reasons beyond their control will, upon disenrollment, be discharged from their enlisted status. It should be understood that two years' active enlisted service may be required of those students who default on the terms of their NROTC contract after the beginning of their sophomore year.

Officers commissioned in the Regular Navy or Marine Corps serve on active duty for a minimum of four years. Those commissioned in the Naval or Marine Corps Reserve serve a minimum of three years on active duty. Specialized training following commissioning adds additional active duty requirements in some cases.

## Choice of Assignment

Graduates have an opportunity to request the duty they prefer upon graduation. These requests are given careful consideration, and every effort is made to assign the newly commissioned officer the duty of his or her choice.

Among the types of assignments are duty in nuclear propulsion for surface ships and submarines, naval aviation, and large and small surface ships. Other specialties are available on a limited basis.

## Marine Corps Options

The United States Marine Corps is an integral part of the Naval Services and is commanded by the commandant of the Marine Corps. One-sixth of the NROTC scholarship students may be Marine selectees who will be designated Marine-option midshipmen. Upon successful completion of the program they will be appointed second lieutenants in the United States Marine Corps.

Marine-option midshipmen will follow the same program as other NROTC midshipmen for the first two years. Beginning with the junior year, Marine-option midshipmen will be taught Marine courses by a Marine officer instructor. For the first class summer-cruise (after the junior year), known as the USMC Officer Candidate School, Marine-option students will travel to Quantico, Virginia, where they will undergo six weeks of intensive training. Upon commissioning the following year as second lieutenants, they will be assigned to the Basic School at Quantico, Virginia. After the Basic School, the Marine officer is assigned duty in a variety of occupational fields. Among the duties available are Infantry, Aviation, Artillery, Tracked Vehicles, Engineers, Communications, Electronics, Supply, Administration, and Computer Science. The officer may serve on board naval vessels or at shore installations of the Marine Corps or Navy, in this country or overseas.

The Marine Corps has a postgraduate educational system similar in objectives and organization to that of the Navy. Marine officers selected for aviation receive flight training at the Naval Air Station, Pensacola, Florida, along with their Navy counterparts.

## Curriculum

A student has three categories of requirements to fulfill as a midshipman. The first of these requirements is a weekly naval professional development session each semester. The second requirement is a naval science course each semester. The last set of requirements consists of other required courses prescribed by the Navy to meet the growing need for more and better technically educated junior officers.

## Naval Professional Laboratories

### Nav S 141-142, 241-242, 341-342, or 441-442

All students in the program participate in one ninety-minute professional development session each week. The session is held from 2:30 until 4:00 on Wednesday afternoon. This period is planned and implemented for the most part by the midshipmen officers in the battalion organization and consists of both drill and professional information briefings. Students gain experience in actual leadership situations and at the same time learn the fundamentals of seamanship, military formations, movements, commands, discipline, courtesies, and honors. During information briefings special emphasis is given to applied leadership as it relates to the administrative and managerial aspects of a Navy or Marine Corps officer's duties.

## Naval Science Courses

All Navy and Marine midshipmen take one naval science course together each semester during their freshman and sophomore years. Navy-option students continue to take a naval science course each semester during their junior and senior years. Marine-option students are required to take the History of Amphibious Warfare and the Evolution of War courses in either their junior or senior year, depending on when the courses are offered.

## Freshman Year (Navy and Marines)

### Nav S 101 Fundamentals of Naval Science

Fall. No credit.

Two-hour class each week (lecture-recitation). Navy staff.

A study of fundamental aspects of naval science, including its conceptual contributions to sea power, factors involved in the physical development of naval forces, resources that must be managed, and prospects for the future.

### Nav S 102 Naval Ship Systems (also Mechanical and Aerospace Engineering 101)

Spring. 3 credits. Three lecture-recitation classes each week.

Prof. M. Louge, Navy staff.

An introduction to primary ship-systems and their interrelationship. Basic principles of thermodynamics, propulsion, mechanical operation, internal communications, electronics, ship structure, and other marine systems are considered.

### Nav S 157 Principles of Sailing

Fall and spring. Physical education credit.

One class each week. Navy staff.

Instruction in basic sailing skills and safety principles. Students sail small and large boats on Cayuga Lake, weather permitting. Focus is U.S. Navy Class B inshore skipper certification.

## Sophomore Year (Navy and Marines)

### Nav S 201 Naval Ships Systems II (Weapons)

Fall. 3 credits.

Lecture-recitations, M W F. Navy staff. The principles and theories used in the development of naval weapons systems are examined. Initially, extensive study is made of sensing and detection systems, especially radar and sonar, followed by discussions of ancillary systems for computing, tracking, stability, and weapons control and delivery. The latter part of the course covers the formal derivation of the fire-control problem and specific U.S. naval weapons.

### Nav S 202 Sea Power and Maritime Affairs

Spring. 3 credits.

Three seminars each week. Navy staff. Discussions examine the history of the Navy as a force in diplomacy. Relationships between Congress and the military for determining the national defense policy are also explored. The last section of the course concentrates on the balance between the superpower navies today. An integrated examination of current events and issues gives a historical perspective throughout the course.

## Junior Year (Navy)

### Nav S 301 Principles of Navigation (also Agricultural Engineering 305)

Fall. 4 credits.

Four classes each week (lecture-recitation-project work).

The course covers coordinate systems, chart projections, navigational aids, instruments, compass observations, tides and currents, and soundings. It also includes celestial navigation, time, spherical trigonometry, motion of the stars and sun, star identification, position fixing, use of the nautical almanac, electronic navigation systems, and air navigation.

### Nav S 302 Naval Operations

Spring. 3 credits.

Three lectures each week. Navy staff. The course covers the application of command and control principles and the integration of sensors and weapons systems in the conduct of naval operations. Visual and electronic communications methods, data-systems employment, tactical disposition of forces, and fleet logistics support are studied. Topics in shiphandling are also discussed.

## Senior Year (Navy)

### Nav S 401 Organizational Behavior and Small Group Processes (also Hotel Administration 414)

Fall. 3 credits.

Current research is examined to provide a conceptual framework for understanding group processes within organizations. In addition, students participate in experiential laboratories aimed at enhancing their effectiveness as members or leaders of groups. Topics include stages of group development, leadership, decision making, motivation, individual versus group needs, organizational communication, power, and organizational change.

**Nav S 402 Naval Administration Topics**

Spring. Two credits.  
A variety of topics important to the naval officer for both professional and managerial development are reviewed. The material is directed at the midshipman for his own understanding of naval administration and for use in the role of the division officer in counseling his subordinates. Through the use of lectures, situation problems, and role playing, the student will learn about the various aspects of Navy management and administration.

**Junior or Senior Year (Marine Options)****Nav S 310 Evolution of War**

Fall. 3 credits.  
3 classes each week. Presentations by Marine Corps staff.

A study of warfare that examines the relationship of military strategy to geography, economics, sociology, technology, and national political realities and values; the evolution of warfare, including principles of war, weapons, and associated equipment; and the effects of nuclear weapons and guerrilla warfare on traditional concepts of national strategy.

**Nav S 410 History of Amphibious Warfare**

Spring. 3 credits.  
Three lectures-recitations each week. Marine Corps staff.

The history of the development, theory, techniques, and conduct of amphibious operations from 490 B.C. to the present. Special emphasis will be on amphibious operations conducted in the central Pacific during World War II. Additionally, the future potential of amphibious operations will be discussed.

**Other Required Courses****Navy Option Scholarship Program**

To be eligible for a commission in the United States Navy, midshipmen must successfully complete all the requirements for a baccalaureate degree in any field of study offered by Cornell University and complete courses in the following subjects (specified courses to be approved by the professor of naval science):

- American military affairs or national security policy (one year)
- English (one year)
- calculus (one year)
- calculus-based physics (one year)
- computer science (one term)
- modern foreign language (one term)—this requirement may be waived by the professor of naval science under some circumstances.

The calculus requirement must be satisfied by the end of the sophomore year and the physics requirement by the end of the junior year.

Although free choice of academic majors is permitted, students are encouraged to pursue majors in engineering and the physical sciences to meet the technological requirements of the modern Navy.

**Navy Option College Program**

Navy-option College Program students must complete one year of college-level study in mathematics, physical science, and English as a prerequisite for commissioning. The mathematics course must be completed by the end of the junior year; the physical science course by the end of the senior year. In addition, one term of computer science is required. College Program students who desire entry into the Navy-option Scholarship Program should fulfill all of the requirements applicable to Navy-option scholarship students to be eligible and competitive for a Professor of Naval Science (PNS) Scholarship.

**Marine Option**

Any midshipman, in either the Scholarship Program or the College Program, who completes all of Cornell University's degree requirements in any academic major is eligible for a commission in the United States Marine Corps or United States Marine Corps Reserve. Marine-option students take the same naval science courses and naval professional laboratories as Navy-option students for the freshman and sophomore years. During the junior and senior years, Marine-option students meet with the Marine officer instructors for naval professional laboratories and take two naval science courses. In addition, two semesters of any courses (a minimum of three hours each) in the following subject areas are required, the intent being to broaden the base of knowledge of the individual. The specific course chosen must be approved by a Marine Officer Instructor (MOI).

- communication skills (oral or written)
- computer science
- economics
- government
- history
- modern languages
- operations research
- organizational behavior
- psychology
- sociology

**University Courses**

A wide range of courses satisfy Naval ROTC science and engineering electives or social sciences and humanities requirements. Students should consult their naval science instructor or adviser concerning appropriate course selections. A partial list of those Cornell University courses that meet academic requirements of the program follows.

**Calculus**

Math 111, and 112 or 122 Calculus  
Math 191, 192, or 193 Calculus for Engineers

**Physics**

Phys 112 or 116, and Phys 213 or 217  
Phys 207-208 Fundamentals of Physics

**Computer Science**

Engr 100 Introduction to Computer Programming  
Com S 100 Introduction to Computer Programming  
Com S 102 Introduction to Microcomputer Applications

Ag En 102 Introduction to Microcomputer Applications  
Ag Ed 447 Instructional Applications of the Microcomputer

**American Military Affairs or National Security Policy**

Econ 306 Economics of Defense Spending  
Econ 307 Introduction to Peace Science  
Govt 349 Political Role of the Military  
Govt 390 Principles of Strategy  
Govt 391 United States National Security Policy  
Hist 313-314 History of American Foreign Policy  
Hist 341 Recent American History, 1945 to the Present

**English**

Fulfilled by completing freshman writing seminar course requirements.

**Extracurricular Activities**

The NROTC midshipman at Cornell is offered a broad range of activities in which to participate. Each summer, as an optional part of their summer training, midshipmen sail aboard the unit sail-training vessel *Vindicator* to distant ports of call. Back at Cayuga Lake, a highly respected sail-training program offers instruction, both in small sailboats and in large-boat sailing on board *Vindicator*, to all who want to participate. The unit offers a comprehensive sports program in which most midshipmen participate. The naval unit has won the Independent Division All Sports Trophy for fifteen of the last twenty-one years. Midshipmen participate in a myriad of social events, including the annual Navy/Marine Corps ball, the All-Service military ball, and traditional naval mess nights.

**DEPARTMENT OF AEROSPACE STUDIES**

Colonel Kent E. Wolcott, United States Air Force, Professor of Aerospace Studies and Commander, Air Force ROTC Detachment 520

Major Paul D. Decker, United States Air Force  
Captain James Marchio, United States Air Force  
Captain Timothy E. Edem, United States Air Force

Captain Peter Sefcik, United States Air Force

The objective of the Air Force Officer Education Program at Cornell is to prepare men and women for positions as officers in the United States Air Force. The program is designed to provide the student with a background of aerospace knowledge and to further develop qualities of leadership, integrity, and self-discipline. The objectives are achieved through Four-Year and Two-Year programs. These programs include specific courses in aerospace studies and practical laboratories.

Entering students are assigned to one of four categories: flying (pilot-navigator), missile, engineering-science, and nontechnical. These assignments are based on the student's preferences, qualifications, and academic field of study and the needs of the Air Force.



## Requirements for Enrollment

The Air Force officer education program is open to any undergraduate or graduate student enrolled in any major field of study. The student's academic course of study is often a prime factor in determining the kind of career pursued in the Air Force. (See Air Force Careers, below.)

Applicants must be U.S. citizens. Noncitizens may enroll and will receive certificates acknowledging completion of the course but cannot receive a commission.

Applicants who are interested in flying (as pilot or navigator) or missile duty should make that request known at the time they enter the program.

All applicants receive physical examinations at no cost and, to be accepted, must meet the physical requirements listed below.

Though the program is designed to prepare future Air Force officers, Department of Aerospace Studies courses are open to all students at Cornell.

## Physical Requirements

Every applicant must be free from any limiting physical infirmity and must have normal hearing, blood pressure, and heartbeat. Weight must be normal for height and age.

Following are the additional specific requirements for nonflying categories.

**Vision:** bilateral distant vision without corrective lenses, at least 20/400.

**Height:** for men, at least sixty, but not more than eighty, inches; for women, at least fifty-eight, but not more than seventy-two, inches.

**Allergy:** no history of asthma since twelfth birthday.

**Dental health:** good.

Those students who are interested in qualifying for flying categories (pilot or navigator) must meet more stringent requirements than outlined above. Students are given physicals at Air Force expense to determine if they qualify.

## Four-Year Program

The Four-Year Program is open to all freshmen. Sophomores may enter the program but require departmental approval. Students in a five-year degree program may enroll in their freshman or sophomore year.

Veterans of the U.S. armed forces and students entering Cornell from military schools may receive advanced standing, subject to approval by the professor of aerospace studies.

The Four-Year Program consists of the General Military Course (GMC) and the Professional Officer Course (POC). For scholarship cadets, the first year of the GMC carries no military commitment, and students may withdraw at any time. For nonscholarship cadets, both years of the GMC carry no military commitment, and students may withdraw at any time.

## General Military Course

Students in the General Military Course take one credit of classroom work offered by the Department of Aerospace Studies each semester. During the freshman year the student examines the organization and mission of the United States Air Force and the role of

U.S. military forces in the contemporary world. In the sophomore year the student studies the history and development of military aviation and American air power. In both years officership, professionalism, and human rights within the United States Air Force are emphasized.

Students also spend 1-1/2 hours a week in a leadership laboratory, which includes classroom instruction in responsibilities and the environment of the junior officer and instruction and practice in basic drill and ceremonies. In addition, all students participate in summer field training for four weeks between their sophomore and junior years.

## Professional Officer Course

The Professional Officer Course (POC) is a two-year advanced course of instruction. Students who are accepted for the POC must have successfully completed or validated the basic course and must meet the academic and physical standards. Each cadet accepted into the POC must sign an agreement to complete the program and accept, if tendered, a commission in the Air Force Reserve on graduation.

Classroom study in the POC requires three hours a week each semester. In the junior year, cadets study Air Force leadership and management at the junior officer level. During the senior year cadets study the elements of national security and the place of the military in American society. Leadership laboratory requires a minimum of 1-1/2 hours a week in the junior and senior years. In the leadership laboratory the cadet is exposed to advanced leadership experiences and applies principles of management learned in the classroom.

## Two-Year Program

The Two-Year Program consists of the last two years (Professional Officer Course) of the regular Four-Year Program plus a six-week summer training course preceding enrollment. (Details of the Professional Officer Course are given above.)

The Two-Year Program is open to male and female students with two years of academic study remaining at Cornell (graduate or undergraduate) or at schools under crosstown or consortium agreement. Applications are accepted from October through April of the year preceding the applicant's planned entry into the program. Selectees are then required to successfully complete a six-week summer training program at government expense.

## Scholarships

Air Force ROTC offers four-year scholarships on a competitive basis to high school seniors and graduates who will major in selected scientific and technical areas such as engineering, mathematics, meteorology, and computer science. Four-year scholarships are awarded on a limited basis to individuals who will major in nontechnical areas. Scholarship information can be obtained from a high school counselor, from Air Force ROTC officers at a campus offering Air Force ROTC, from a local Air Force recruiter, or from AFROTC/RROO, Maxwell AFB, AL 36112-6663. The deadline for submitting a four-year scholarship application is December 1 of the year preceding the academic year in which a student wants to enter the program. *Students should apply early.*

Scholarships for 3-1/2, 3, 2-1/2, and 2 years are also available to college students. There are also two- and three-year scholarships for qualified men and women who are pursuing selected medical and nursing degrees.

Applications for these scholarships should be made to the professor of aerospace studies during the freshman or sophomore years of college. Appropriate application information is furnished by the professor of aerospace studies at the Air Force ROTC detachment. Selections are based on scores achieved on the Air Force Officer Qualifying Test, the overall grade point average, and the rating from an interview board composed of Air Force ROTC staff officers. All scholarships pay, at a minimum, \$7,500 toward tuition and provide a \$100 monthly nontaxable allowance during the school year.

## Fees

An initial uniform deposit of \$30 is required on entry into AFROTC. There are two subsequent \$30 uniform payments due, one on entry into the POC and the final one before commissioning, at which point the cadet owns the uniform.

## Benefits

All cadets in the advanced program (POC) receive a \$100-a-month, nontaxable subsistence allowance for the academic year. During the four- or six-week summer field training (see below), each cadet receives the pay allowance authorized by current directives, plus an allowance for travel to and from the field site. Most textbooks and supplies required for Department of Aerospace Studies courses are provided.

All cadets are eligible to participate in field trips made to Air Force bases throughout the country. Scholarship and advanced cadets (POC) are entitled to space-available travel on Air Force aircraft flying within the continental United States.

## Field Training

There are two types of field training: a four-week course for cadets in the Four-Year Program and a six-week course for Two-Year Program applicants. Students in these programs normally attend field training between their sophomore and junior years. Field training is hosted each summer by several active Air Force installations.

Field training is designed to stimulate the development of military leadership and skills through meaningful experiences. The curriculum consists of aircraft, aircrew, and survival orientation; junior officer training; physical training; small arms training; a social-actions program; and supplemental training. Special emphasis is placed on career orientation and interaction with other young officers in fields of interest to the student. The six-week training program is unique because it has an additional sixty hours of academic course work similar to that taken during the freshman and sophomore years.

Pilot candidates attend a three-week light aircraft orientation program between their junior and senior years. Objectives of the program are to train and motivate qualified cadets toward a rated career and to screen those cadets who have the potential to become Air Force pilots.

In addition to field training, Army airborne training (parachute jumping instruction) is available between the junior and senior years as an extracurricular activity.

### Advanced Training Program

This program allows selected cadets to visit active duty Air Force bases for a two- or three-week period during the summer following their junior year. As "third lieutenants," cadets receive specialized career orientation and an opportunity to experience leadership, human relations, and management challenges encountered by Air Force junior officers. Cadets have an opportunity to become familiar with the Air Force way of life.

### Commissioning Obligations

All students who successfully complete the AFOTC advanced program (POC) and who are awarded a baccalaureate degree are commissioned as second lieutenants in the Air Force.

Second lieutenants commissioned in nonflying categories are required to serve on active duty for four years. Pilot trainees are required to serve on active duty for eight years after completing flying training and receiving their aeronautical rating. Navigator trainees serve five years after completing training. Some newly commissioned officers are allowed to postpone active service to earn advanced degrees.

### Air Force Careers

Air Force policy has been to assign new officers to a career field appropriate to their educational background. Students in the engineering-scientific category may be assigned to practice in their specialty in research and development, communications, aeronautics, astronautics, design and development, the biological sciences, computer design and maintenance, meteorology, or various other engineering and scientific fields. Those graduating in the nontechnical category can anticipate assignments in manpower management, administration, logistics, police and investigation, intelligence, personnel, transportation, information, and numerous other career fields. They will use their educational backgrounds in positions of responsibility and be given the opportunity to develop further their managerial and administrative skills.

Any undergraduate major is suitable for those who are qualified and interested in becoming pilots or navigators. After completion of flying training they are assigned primary duties flying various kinds of aircraft.

Officers who elect missile duty will train and be assigned to one of the operational missile bases as a crew member. This type of assignment provides an opportunity for a young officer to obtain command experience.

## Curriculum

Students in the Four-Year Program are required to take all courses listed below. Students in the Two-Year Program are required to take all of the courses listed for the junior and senior years.

### Freshman Year

**Air S 161 United States Military Forces**  
Fall. 1 credit.

One class each week.

A study of current U.S. military forces with emphasis on the analysis of the doctrine and mission of the United States Air Force. Army and Navy operations, as contributions to the total national defense, are reviewed. Current factors affecting today's professional military officers are considered.

**Air S 162 Aerospace Operations**  
Spring. 1 credit.

One class each week plus a field trip to a local military installation.

The aerospace forces of the United States are studied with emphasis on the organization and resources of the United States Air Force. The elements of strategic offensive, defensive general-purpose, and aerospace support forces throughout the world are also studied.

### Sophomore Year

**Air S 211 Development of Military Aviation**  
Fall. 1 credit.

One class each week.

Factors leading to the development of aviation and the concepts and doctrine for the employment of air power are studied. Topics to be reviewed and analyzed include the history of manned flight, the effects of World War I on the uses of aviation, the development of pre-World War II aircraft, and the political struggles for an independent U.S. air arm. The role of air power in World War II, including strategic bombing, tactical air power, and the role of air superiority in warfare, is examined.

**Air S 212 American Air Power since 1947**  
Spring. 1 credit.

One class each week.

The employment of the Air Force since World War II in military and nonmilitary operations to support national objectives is discussed. Effects of technology on defense policy and strategy are reviewed. The part played by the air forces in activities such as the Berlin airlift and national and international relief missions is discussed. The role of air power in the Korean conflict, the Cuban crisis, and the Vietnam War is examined from the viewpoint of technology and tactical doctrine.

### Junior Year

**Air S 331 Leadership and Communicative Skills**  
Fall. 3 credits.

Three classes each week.

The course is divided into three major parts. Part one provides an introduction to the principles and techniques used in the development of effective communication skills through the use of the interpersonal communication model. Part two explores the impact that both individual and group behavior have on organizational goals, with special emphasis on management theories that have evolved to explain human motivation. Part three deals with leadership as a function of the manage-

ment principle of directing. Attention is given to the impact that various leadership styles have on human motivation and organizational effectiveness. Current leadership research and theory and the responsibilities of command are considered. Case-study exercises and oral and written assignments are required.

**Air S 332 Management**  
Spring. 3 credits.

Three classes each week.

Introductory course that deals with the basic principles of management, including planning, organizing, staffing, and controlling. Students will prepare business plans that incorporate the various principles of management to include the study of quantitative methods and computer-generated financial reports used to enhance the management decision-making process. Also considered is the role of management in the development of a corporate code of ethics in relationship to marketing strategies and tactics. Case studies, problem sets, business plans, and oral presentations are required.

### Senior Year

**Air S 461 National Security Forces in Contemporary American Society I**  
Fall. 3 credits.

Two classes each week.

This course examines American national security policies in the post-World War II period by seeking to understand the people, politics, and processes involved in their formulation and implementation. A series of historical case studies are used to illustrate both the functioning of this system and the problems associated with it.

**Air S 462 National Security Forces in Contemporary American Society II**  
Spring. 3 credits.

Two classes each week.

The functions and roles of the military officer in a democratic society are studied through an examination of topics such as the concept of military professionalism and the military's role in politics. Other issues including the challenges and problems posed by the all-volunteer force, the ethical dilemmas confronted by the military officer, and the new roles played by the military in the war against drugs and terrorism likewise are explored. The course concludes with a brief look at the essential features of the military justice system.

### Leadership Laboratory Courses

All Air Force cadets spend at least 1-1/2 hours a week throughout the academic year in a leadership laboratory, for which no academic credit is given. Occasionally laboratories are held at times other than the normally scheduled period (such as the fall Veterans Day parade and the spring Military Awards Ceremony). All cadets are also expected to participate in an evening dining-in and to meet minimum physical fitness and weight standards each semester.

**Air S 141-142 Initial Military Experiences**

Introduction to the responsibilities, life, and work of an Air Force officer. Basic knowledge of drill and ceremonies, military courtesies, and the wearing of the uniform. Field trip to a local military installation.

**Air S 241-242 Intermediate Military Experiences**

Develops skills in giving commands for drill and ceremonies. Introduction to the Air Force base environment in which the Air Force officer functions. Includes a look at career areas available based on academic majors. Students experience and participate in leadership situations through military drills and ceremonies. Field trip to a local military installation.

**Air S 341-342 Junior Officer Leadership**

Cadets assume leadership responsibilities similar to those of a junior officer. Emphasis is on comprehending the importance of applying effective human relations in dealing with superiors, peers, and subordinates. Relationship between Air Force specialty codes and academic majors. The importance of basic health habits to leadership.

**Air S 441 Advanced Leadership Experiences**

Command leadership in operating a military organization. Cadets apply effective leadership and managerial techniques with individuals and groups and participate in self-analysis of leadership and managerial abilities.

**Air S 442 Precommissioning Laboratory**

Factors that facilitate transition from civilian to military life are reviewed. The need for military security, base services and activities, personal finances, travel regulations, and social obligations are introduced.