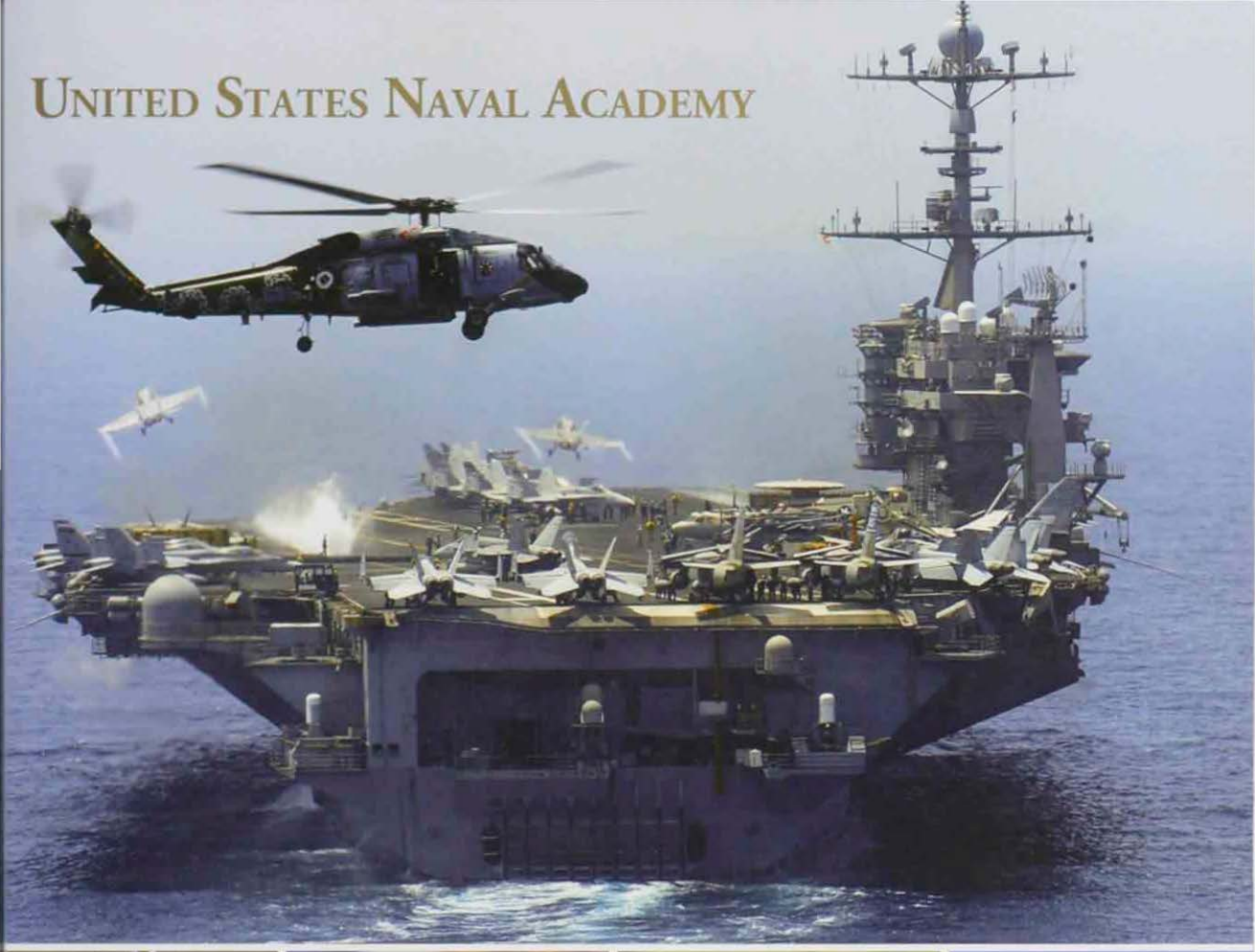
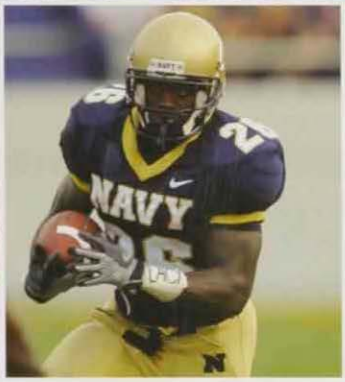
United States Naval Academy





Honor · Courage · Commitment

Profile

The school Founded as the Naval School in 1845, the United States Naval Academy today is a four-year service academy that prepares midshipmen morally, mentally and physically to be professional officers in the naval service.

Location The academy is set on 338 acres between the south bank of the Severn River and historic downtown Annapolis, the state capital of Maryland. Annapolis is 33 miles east of Washington, D.C., and 30 miles southeast of Baltimore.

Campus The Yard, as the campus is called, features tree-lined brick walks, French Renaissance and contemporary architecture and scenic vistas of the Chesapeake Bay. The Bancroft Hall dormitory complex, the Naval Academy Chapel, and other century-old buildings make the academy a National Historic Site. New facilities, such as the Uriah P. Levy Center and Jewish Chapel, a multi-purpose Alumni Hall, Rickover Hall engineering complex, the Hendrix Oceanography Laboratory, and the new Wesley Brown Field House give the academy state-of-the-art educational resources.

Students More than 4,000 men and women represent every state in the U.S. and several foreign countries.

Faculty The 560-member Naval Academy faculty is an integrated group of military and civilian instructors in approximately equal numbers. The student-faculty ratio is 8:1, with most class sizes ranging from 10 to 22 students.

Academics In addition to a core curriculum of academic and professional courses, majors are offered in 22 subject areas: seven in engineering; eight in science, mathematics and computer science; and seven in the humanities and social sciences.

Professional Midshipmen study subjects such as small arms, drill, seamanship and navigation tactics, naval engineering, naval weapons, leadership, ethics and military law during the four-year program. In addition, midshipmen train at naval bases and on ships in the fleet during part of each summer.

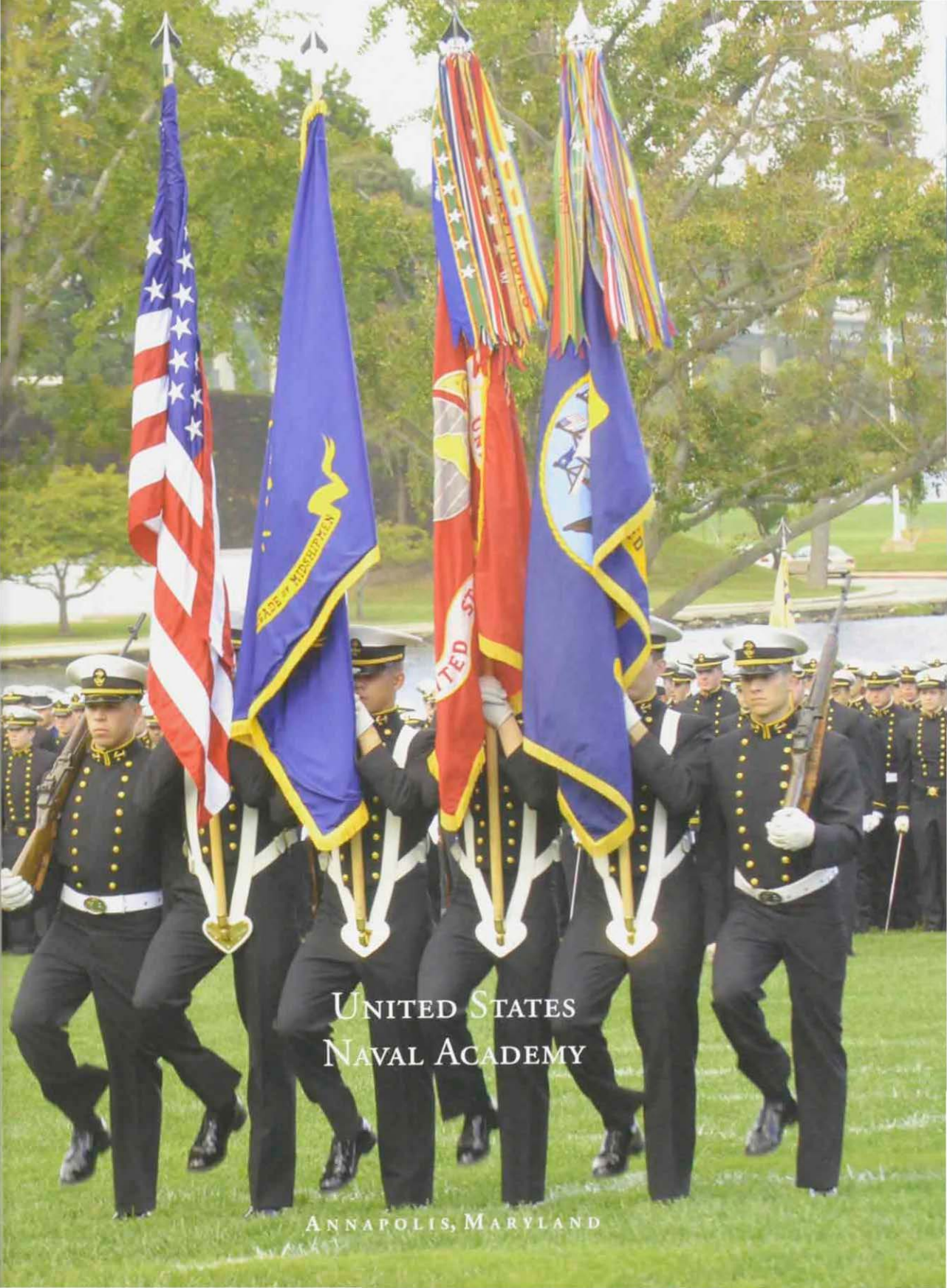
Athletics Midshipmen can choose from a total of 32 intercollegiate varsity sports: 19 for men, 11 for women and 2 co-ed. Students can also choose from 16 intramural and 15 club sports.

Extracurricular Exciting extracurricular activities are offered in areas ranging from engineering societies to military professional clubs and associations.

Graduation Bachelor of science degrees specifying a major field are awarded to midshipmen upon graduation in May. They receive commissions as ensigns in the U.S. Navy or second lieutenants in the U.S. Marine Corps and serve at least five years of exciting and rewarding service as officers.

For more information, call the Admissions Office: (410) 293-4361
or write: Office of Admissions
United States Naval Academy
117 Decatur Rd.
Annapolis, Md. 21402-5018

or reach us on the web: *www.usna.edu/Admissions*



United States Naval Academy

Annapolis, Maryland

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At the United States Naval Academy, our students are challenged morally, mentally and physically like never before in their lives. Students come here because they yearn for a challenge and want to be part of something larger than themselves. Naval Academy Midshipmen are given responsibility and leadership opportunities commensurate with their status within the Brigade.

The Honor Concept

Midshipmen are persons of integrity: They stand for that which is right.

- They tell the truth and ensure that the truth is known. They do not lie.
- They embrace fairness in all actions. They ensure that work submitted as their own is their own, and that assistance received from any source is authorized and properly documented. They do not cheat.
- They respect the property of others and ensure that others are able to benefit from the use of their own property. They do not steal.

Introduction

United States Naval Academy

As the undergraduate college of the naval service, the Naval Academy prepares young men and women to become professional officers of competence, character, and compassion in the U.S. Navy and Marine Corps. Naval Academy students are midshipmen on active duty in the U.S. Navy. They attend the academy for four years, graduating with bachelor of science degrees and commissions as ensigns in the Navy or second lieutenants in the Marine Corps. Naval Academy graduates serve at least five years in the Navy or Marine Corps.

Around the Yard

The scenic Naval Academy campus, known as the Yard, is located in historic Annapolis, Md., where the Severn River flows into the Chesapeake Bay. With its combination of early 20th-century and modern buildings, the Naval Academy is a blend of tradition and state-of-the-art technology that exemplifies today's Navy and Marine Corps. Throughout the Yard, tree-shaded monuments commemorate the bravery and heroism that are an inherent part of the academy's heritage. Buildings and walkways are named for Naval Academy graduates who have contributed to naval history and their nation.

The Naval Academy also is the final resting place of Revolutionary War naval hero John Paul Jones whose words, "I have not yet begun to fight," have inspired generations of naval officers. His crypt is located beneath the Academy chapel. A National Historic Site, the Naval Academy hosts more than one million tourists every year from all over the United States and around the world. They come to enjoy the natural beauty of the Yard, to recall some of this country's naval history and to marvel at the traditions carried on in midshipmen parades and military formations.

Tourists and midshipmen also appreciate downtown Annapolis, which lies outside the gates of the Academy. With its colonial charm and busy waterfront, Maryland's state capital provides a pleasant, diverse setting for one of America's premier colleges, the United States Naval Academy.

History

Founded in 1845 by Secretary of the Navy George Bancroft, the Academy started as the Naval School on 10 acres of old Fort Severn in Annapolis. Since then, the development of the Naval Academy has reflected the history of the United States. As our country has changed culturally and technologically, so has the Naval Academy. In only a few decades, the Navy has moved from a fleet of sail and steam-powered ships to a high-tech fleet with nuclear-powered submarines and surface ships and supersonic aircraft. The Academy has changed, too, giving midshipmen the up-to-date academic and professional training they need to be effective naval officers in their assignments after graduation.

In 1850 the Naval School became the United States Naval Academy. A new curriculum went into effect requiring midshipmen to study at the Academy for four years and to train aboard ships each summer. That format is the basis of a far more advanced and sophisticated curriculum at the Naval Academy today. As the U.S. Navy grew over the years, the Academy expanded. The campus of 10 acres increased to 338. The original student body of 55 midshipmen grew to a brigade of 4,000 midshipmen. Modern granite buildings replaced the old wooden structures of Fort Severn and the Naval School.

Congress authorized the Naval Academy to begin awarding bachelor of science degrees in 1933. The Academy later replaced a fixed curriculum taken by all midshipmen with the present core curriculum plus 21 major fields of study, a wide variety of elective courses and advanced study and research opportunities.

Mission

The Naval Academy has a unique clarity of purpose, expressed in our mission: "To develop midshipmen morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to provide graduates who are dedicated to a career of naval service and have potential for future development in mind and character to assume the highest responsibilities of command, citizenship and government." Our mission forms the basis for everything we do at the Academy. It also encourages a sense of spirit and pride found at few other schools.

Program

Developing midshipmen morally, mentally and physically contributes to producing outstanding naval officers of competence, character, and compassion.

Moral Development

Moral development is a fundamental element of all aspects of the Naval Academy experience. As future officers in the Navy or Marine Corps, midshipmen will someday be responsible for the priceless lives of men and women and multi-million dollar equipment. From Plebe Summer through graduation, the Naval Academy's Officer Development program is a four-year integrated continuum that focuses on the attributes of integrity, honor, and mutual respect. This program helps develop midshipmen to possess a clearer sense of their own moral beliefs and the ability to articulate them. Honor is emphasized through the Honor Concept of the Brigade of Midshipmen—a system which was originally formulated in 1951 and states, "Midshipmen are persons of integrity: they stand for that which is right." These Naval Academy "words to live by" are based on the moral values of respect for human dignity, respect for honesty and respect for the property of others. A Brigade Honor Committee, composed of upperclass midshipmen, is responsible for

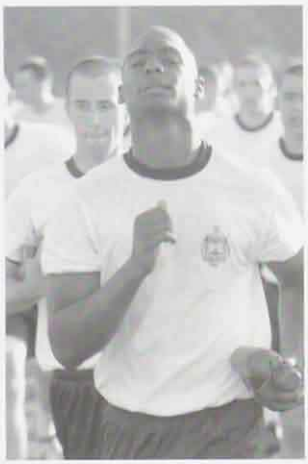
education and training in the Honor Concept. Midshipmen found in violation of the Honor Concept by their peers may be separated from the Naval Academy.

Mental Development
Every midshipman's academic program begins with a core curriculum that includes courses in engineering, science, mathematics, humanities and social science. This is designed to give you a broad-based education that will qualify you for practically any career field in the Navy or Marine Corps. At the same time, our majors program gives you the opportunity to develop a particular area of academic interest. For especially capable and highly motivated students, we offer challenging honors programs and opportunities to start work on postgraduate degrees while still at the Academy.

Physical Development
We teach the importance of being physically fit and prepared for stress because the duties of Navy and Marine Corps officers often require long, strenuous hours in difficult situations. The physical requirements of Plebe Summer training, four years of physical education and year-round athletics also develop pride, teamwork and leadership.

Professional and leadership training
We don't just tell you about life in the Navy and Marine Corps, you live it. After four years at the Naval Academy, the life and customs of the naval service become second nature. First, you learn to take orders from practically everyone, but before long, you acquire the responsibility for making decisions that can affect hundreds of other midshipmen. Your professional classroom studies are backed by many hours of practical experience in small-unit leadership on land and on the water.

Control of the seas means security. Control of the seas means peace. Control of the seas can mean victory. The United States must control the sea if it is to protect our security.
—President John F. Kennedy



About our Midshipmen

It takes a special kind of young man or woman to handle the Naval Academy's demanding program, but that doesn't mean all midshipmen are alike. Midshipmen come from all 50 states, U.S. territories and several foreign countries. They have roots in cities, suburbs, farms and ranches, small towns and military bases. They have talents and hobbies of every kind and personalities that fit every description, and they represent the diverse ethnic and cultural heritages that, together, make the United States a great nation. Some characteristics seem to be common among Naval Academy midshipmen, however. The charts on these pages show you that midshipmen are good students, leaders in their high schools and communities and participants in competitive sports. But other common qualities of midshipmen don't show up in statistics. The young men and women who choose the Naval Academy are looking for more than a college degree. They like the idea of being challenged mentally, physically and morally. They are people who don't want to settle for the ordinary, the routine or the easy.

Midshipmen also want to serve their country in a meaningful way—in a profession that helps preserve our nation's freedoms. Finally, midshipmen are young people who look to the future. They look forward to the challenging Naval Academy program, as well as the opportunities open to them in the Navy and Marine Corps after graduation.

CLASS OF 2012 in Review

Applicants and Nominees

Applicants (includes nominees)	10,960
Number of applicants with an official nomination	3,838
Nominees qualified scholastically, medically and in physical aptitude	2,196
Offers of admission	1,537
Admitted	1,261

Rank and Activities

Class rank in top 40%	91%
Varsity Athletics	90%
Team Captain	62%
Student Body Leader	35%
Band Member	20%
Military Organizations (i.e. JROTC/Sea Cadets)	20%
Community Service	84%
School Publication staff	23%
Religious Group	54%
Work Part-time (>10 hours per week)	21%
Dramatics, public speaking, debating	88%

Previous College and Prep School

The Class of 2012 includes 27.5 percent (343) from college and post-high school preparatory programs which include:

- 202 from the Naval Academy Preparatory School (NAPS) in Newport, R.I.;
- 11 from the Nuclear Power School Program
- 62 from the U.S. Naval Academy Foundation Program; (44 from preparatory schools and 18 from colleges under Foundation sponsorship
- 68 additional students have completed at least one semester of study at a college or university (63), or a private preparatory school (5).

Military Background

The Class of 2012 includes 67 midshipmen who previously served as enlisted members of the Navy (46), Marine Corps (20), or Army Reserves (1). This figure includes 14 who entered directly from Fleet Service (7 USN, 7 USMC), 11 from Nuclear Power School and 41 from NAPS (28 USN, 13 USMC).

Geographical Distribution

Midshipmen were admitted from every state in the nation, as well as Washington, D.C., Puerto Rico, U.S. Virgin Islands and Guam. The Class of 2012 also includes fourteen international students from the following countries: Algeria, Costa Rica (2), Ecuador, Kazakhstan, Lithuania, Madagascar, Montenegro, Pakistan (2), Peru, Romania, Singapore, and Taiwan.

Minorities and Women

The Class of 2012 includes 28.1% (351) minority midshipmen with ethnic backgrounds as follows: African American (83), Hispanic (131), Asian American (68), Native American (32) and Hawaiian/Pacific Islanders (37).

The Class of 2012 includes 21% (261) women.

Sons and Daughters of Alumni

The Class of 2012 includes 47 sons and 17 daughters of Naval Academy alumni. Both parents of four members of the entering class are alumni of the Naval Academy.

My goal was to surround myself with and lead people of character and vision. Most of all, I want to contribute to defending the democratic ideals that this nation stands for.
—2ND LIEUTENANT GENEVIEVE STUDER, USMC
CLASS OF 2008

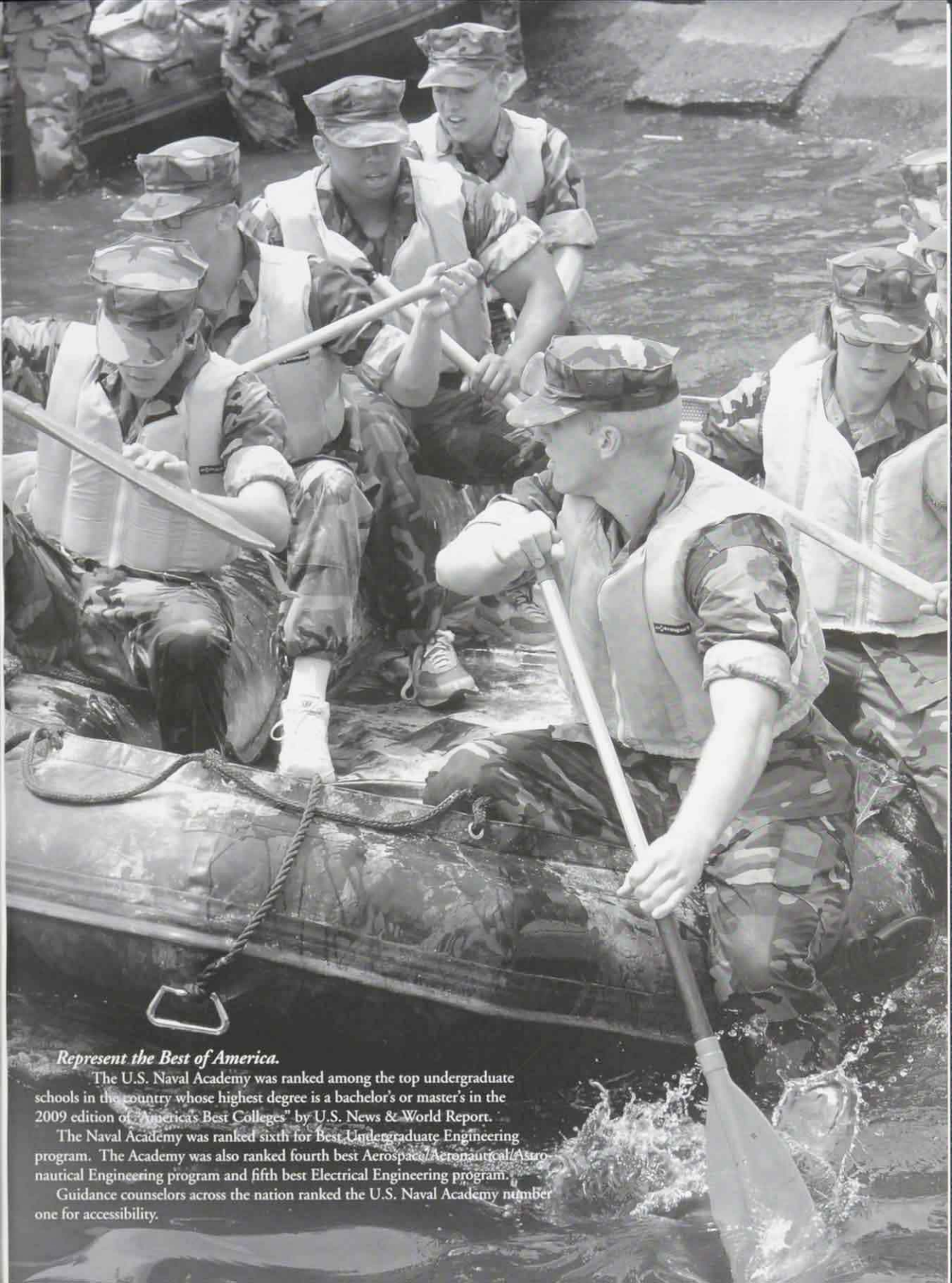
Our Commitment

Setting apart the Naval Academy from almost every other college and university in the country is our commitment to the total development of our students. Some other colleges offer more majors in academics. Some put more emphasis on intercollegiate athletics. But nowhere else do you have a better opportunity to grow intellectually, personally and physically than at the Naval Academy. If you are chosen to enter the Naval Academy, we believe you can complete this tough, four-year program. In fact, we are committed to the principle of helping every midshipman succeed. We back up that commitment with:

- *Small class size.* Most classes have no more than 22 students. When you are an upperclassman, some courses in your major may have only five to 10 other students.
- *Low student-to-faculty ratio.* Faculty members get to know you personally in and out of the classroom. They also are available to help with extra instruction or special projects. It's not unusual to find professors and midshipmen burning the late-night oil together in an Academy research lab or in a classroom.
- *Protected study time.* Evening study period is reserved from 8-11 p.m. Sunday through Friday to help all midshipmen keep up with their courses. Additionally, Nimitz Library, computer labs and other facilities are open for midshipmen use all day and evening, seven days a week.
- *Academic advising.* To help you plan your curriculum, you get group and individual counseling as well as an academic adviser early in plebe year. A permanent faculty adviser is assigned when you select your major.
- *Leadership and counseling.* Your company officer and senior midshipmen also guide, monitor and evaluate your progress in academics, military performance and conduct. They also are ready to help in the event of problems, as are the Academy's staff of chaplains and professional counselors.
- *A sponsor program.* Hundreds of families in the Annapolis area sponsor newly-arrived midshipmen, offering a home away from home and a place to relax off campus. Every midshipman has the opportunity to be sponsored by a local family. These contacts often grow into deep friendships that last a lifetime.

Your Commitment

Becoming a midshipman at the Naval Academy is a big step. It's not like starting your freshman year at a civilian college. You make a commitment to something larger than yourself. You take an oath of office, promising to be loyal to your country and to defend it if necessary. You agree to be honorable in everything you do and say. You're also expected to work harder than you've ever worked before and to push yourself beyond your old limits. This is how we prepare you for the challenging responsibilities of service as a naval officer and the opportunities of a lifetime in the Navy and Marine Corps.

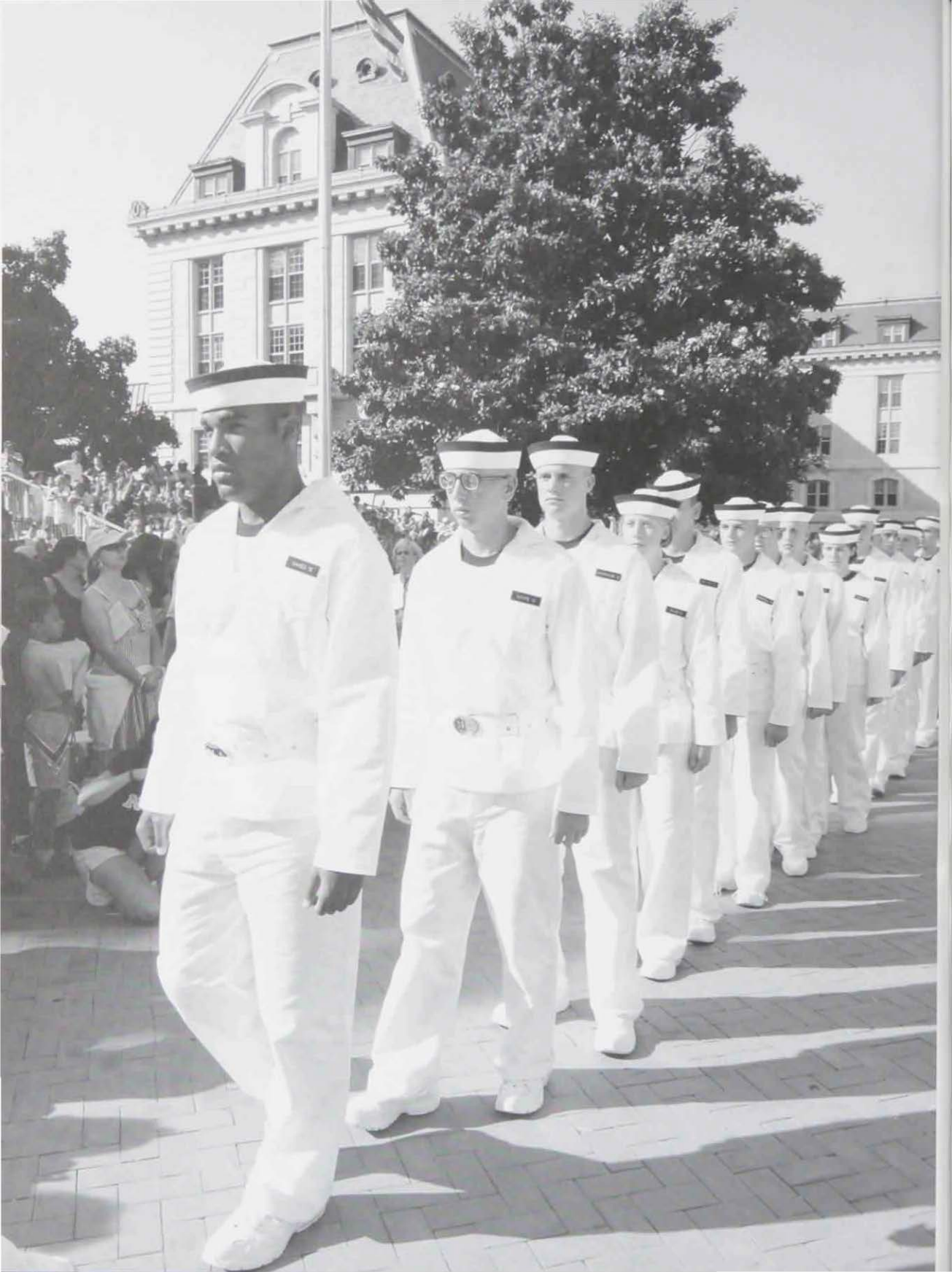


Represent the Best of America.

The U.S. Naval Academy was ranked among the top undergraduate schools in the country whose highest degree is a bachelor's or master's in the 2009 edition of "America's Best Colleges" by U.S. News & World Report.

The Naval Academy was ranked sixth for Best Undergraduate Engineering program. The Academy was also ranked fourth best Aerospace/Aeronautical/Astronautical Engineering program and fifth best Electrical Engineering program.

Guidance counselors across the nation ranked the U.S. Naval Academy number one for accessibility.



In order to be prepared for naval service you have to take advantage of the opportunities. The academy offered esprit de corps, academic excellence, safe surroundings, physical standards, and excellent camaraderie.
—Ensign Erica Reid-Dixon, Class of 2008

Admissions

Competition to become a midshipman is keen, but if you are of excellent moral character, have prepared yourself for a challenging, multidimensional four-year program and want the privilege to serve as a leader of Sailors and Marines who volunteered to serve their country, you should apply for admission.

Applying to enter the Naval Academy is different than most other college admissions processes. In addition to reviewing your academic record, our Admissions Board evaluates your physical fitness, leadership potential and motivation to be a midshipman and an officer in the Navy or Marine Corps. You must be recommended by teachers, interviewed by an academy representative and nominated by at least one official source. We'll guide you through the nomination process later in this chapter.

We want to ensure that the best-qualified candidates from around the United States and its territories are selected for admission and that young men and women have the drive and motivation to complete the four-year program and excel as Navy and Marine Corps officers. All candidates have an equal opportunity for consideration, and eligible men and women of all backgrounds are strongly encouraged to apply. The Class of 2012 includes 28 percent minority midshipmen who represent the unique racial and ethnic minority backgrounds found throughout our nation. The Class of 2012 is comprised of 21percent women.

Dean of Admissions

Naval Academy Dean of Admissions Stephen "Bruce" Latta, has a long association with the Naval Academy and the United States Navy. Dean Latta graduated with the Class of 1978, attended flight school and was designated a Naval Aviator in 1980. During his Naval Career, he Commanded Patrol Squadron Four and Training Air Wing Four. In 2002, he returned to the Naval Academy to serve as the Director of Admissions and later as Vice Dean of Admissions. In 2006, he retired after 28 years of Naval service and then became the Dean of Admissions in November 2006.

"The admissions process at the Naval Academy is unique in that we are not just selecting men and women for the purpose of attending a college, rather we are selecting these young Americans to prepare them for a calling to service and a very special way of life.

Members of the Admissions Board spend countless hours reviewing candidate records. This is a tough job because of the breadth and diversity of our candidates' backgrounds. They are aspiring achievers; highly motivated and well-rounded students who excel not only academically, but also in athletics, leadership and service. The majority will enter directly from high school, but many others will come from college or preparatory school programs or from service as enlisted Sailors and Marines.

I personally believe that all of the candidates we accept can successfully complete the program if they maintain their desire and motivation. In fact, over the last ten years, the Naval Academy has averaged a graduation rate in excess of 80 percent. I think this is attributable to the combination of our taking great care, first to match the right candidates to our program, and then to help them succeed while they are here.

If you have a strong will to achieve, desire a real challenge, and want to be a leader serving your country, the opportunity of a lifetime could begin for you at the United States Naval Academy. It is one of the greatest adventures you could possibly imagine!"

The arts of leadership and discipline are synonymous. No man is worth his salt without self-discipline.
—Admiral John S. McCain, Jr., Class of 1931

Eligibility Requirements for Applying to the U.S. Naval Academy

You must be:

- at least 17 years of age and must not have passed your 23rd birthday on July 1 of the year of admission;
- unmarried, not pregnant and have no incurred obligations of parenthood;
- a United States citizen (except for the limited number of international midshipmen specifically authorized by Congress); and
- of excellent moral character.

Other Qualifications Necessary for Admission

You must:

- be found academically qualified to compete for an appointment by the Naval Academy admissions board;
- be medically qualified;
- complete the Candidate Fitness Assessment (CFA) used by all service academies; and
- receive an official nomination from one of many sources available (see following pages).

You are then eligible to compete for an appointment.

How to Become Competitive for Admission and Prepare for Academic Success

The academic program at the Naval Academy is very challenging, even by comparison with programs at other leading U.S. colleges and universities; consequently your preparation will be extremely important. Because the USNA program emphasizes mathematics, science, engineering and writing, your school preparation should include the following:

- mathematics — four years of mathematics courses, with a strong foundation in geometry, algebra and trigonometry.
- English - four years of course work in English with a special emphasis on the study and practice of effective writing.

Your application will be strengthened if, in addition to the above, you have had:

- Mathematics - courses in pre-calculus or calculus.
- Science — two years with at least one year of chemistry, with laboratory experience
- English — additional courses in English and American literature as well as courses in other areas that emphasize writing.
- Foreign language — at least two years, preferably four, in a single language. Course work should include regular use of the spoken language and encompass elementary syntax and grammar.

To further enhance your competitiveness for admission and your preparation for academic success, the following is also recommended:

- Physics - a full year including a laboratory experience
- History - a full year of U.S. history and, where possible, a full year of European or world history.
- Computer skills - familiarity with personal computers, including the use of the Windows operating system, word processing, spreadsheets, and the Internet.

To demonstrate your ability to meet the physical and time management demands of four years at the Naval Academy, you should take part in athletic and non-athletic extracurricular activities. Since every midshipman is involved in physical exercise every day at the Academy, it is important that you get in excellent physical condition while still in high school. Plebe Summer is not the time to try to whip yourself into shape. Since we are also interested in your leadership potential, as well as your ability to manage your time, we will carefully consider your non-athletic activities and record of part-time employment or military service to evaluate your versatility and ability to accept responsibility. And, by all means, stay away from illegal drugs and abuse of alcohol.

There are many dimensions that one has to take into consideration when applying to the Naval Academy, to include response to structure, career goals, post-graduation lifestyle preference, dedication, and intrinsic motivation. The Naval Academy is a fine institution, but the old saying rings true: it's not for everyone.
—2ND LIEUTENANT GENEVIEVE STUDER, USMC
CLASS OF 2008

Steps Toward Gaining Admission

1. You should apply for admission between April 1st of your junior year in high school and January 31st of your senior year in high school. Since many Congressional offices begin processing nomination requests during the spring and summer, the earlier you apply the better. You can also apply from college or the military service if you meet age requirements. In all cases, for information and a Preliminary Application go online and complete the Preliminary Application via the Naval Academy web page at www.usna.edu/Admissions/preapplication/. Based on the information submitted, particularly scholastic achievement, the Office of Admissions will advise you whether your present record is strong enough to be competitive for admission. If so, you will be identified as an official candidate and you will receive information on accessing and completing an online application.

2. Obtain a social security number, if you do not already have one.

3. Apply for a nomination. (See specific information on the following pages.)

4. Take the SAT or ACT college admission tests. Check with your school counselor or visit their websites (www.collegeboard.com and www.act.org) for details of test dates and registration requirements. Additionally, students often see a considerable test score improvement on a second or third attempt at both tests. The Naval Academy's Admissions Board uses the highest combination of verbal/critical reading and math scores from all SAT or ACT tests taken by a candidate. The writing section should be taken by all candidates. Therefore, candidates will normally enhance their competitiveness simply by taking both the SAT and the ACT more than once.

Test results from the December ACT and January SAT are the last ones an applicant can use to qualify as a candidate and receive an application for the Naval Academy Class of 2013. The college code numbers to forward your test scores to the Naval Academy are: SAT- 5809; ACT - 1742. However, you should be aware that test results from the December 2008 ACT and the January 2009 SAT are the last ones that the Admissions Board will use to evaluate candidates for the Class of 2013.

Non-standard, un-timed tests are not acceptable.

Official Candidates

1. Once you are named an official candidate, you will receive a letter with instructions on how to complete the online candidate application. You should complete the forms and ensure they are submitted online as soon as possible. The Admissions Board will review your application to determine your scholastic qualification once all of your candidate forms are received online. The status of your specific application is always updated on the Candidate Information System (CIS).

2. Take the Candidate Fitness Assessment(CFA). All official candidates must complete a CFA to qualify for admission to the Academy. The CFA tests your coordination, strength, speed and agility. If you are physically fit, the CFA should present no problem. Admission to the Academy is extremely competitive and the Admissions Board reviews the CFA score. If you fail or perform poorly the first time you take it, you will be able to submit new results to USNA.

The CFA may be administered by any varsity coach, physical education instructor, a commissioned military officer on active duty, or your Blue and Gold Officer.

3. Take the Qualifying Medical Examination. (Also see Appendix A.) The Naval Academy's program is physically demanding and, because of the medical standards required for commissioning as Navy and Marine Corps officers, we require all candidates to undergo a

thorough medical examination. After the Naval Academy designates you as a candidate and you have completed five or more documents of the application, the Department of Defense Medical Examination Review Board (DODMERB) will advise you how to begin the examination process. Healthy candidates usually have little difficulty passing the examination. However, conditions are sometimes identified which could either be aggravated by our rigorous program or restrict military service after graduation. Some medical considerations, including our revised policy regarding tattoos and surgical/laser procedures to improve vision, are discussed in Appendix A.

4. Interview with a Naval Academy Information (Blue and Gold) Officer in your area (see the following pages for a listing of Blue and Gold Area Coordinators). If you have any questions about your candidacy at any point during the admissions process, your Blue and Gold Officer is your best resource for advice and for obtaining your specific admissions status. Your candidate packet letter can provide you with information on the candidate information website where you will be able to obtain the name and contact information of your Blue and Gold Officer.

Obtaining a Nomination

All applicants must obtain a nomination from an official source during the admissions process. There are many sources of nomination, and applicants should apply to all sources for which they are eligible.

You should apply for a congressional nomination during the spring of your junior year in high school, or as soon thereafter as possible. Many members of Congress evaluate candidates and make their decisions in early fall, although the Academy accepts nominations until January 31. You must work directly with your Congressional offices to determine their deadlines and requirements. Applicants for military service-connected nominations should apply directly to the Naval Academy for a nomination between July 1 of the year prior to admission and January 31 of the year of admission.

Nomination sources

Applicants should seek nominations from the following sources as appropriate:

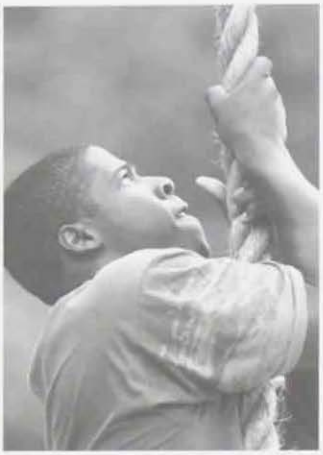
Congressional sources

U.S. Senators, Representatives, the Delegate to Congress from the District of Columbia, the Resident Commissioner of Puerto Rico.

Each member of Congress may have five constituents attending the Naval Academy and charged to them at any one time. When a constituent leaves the Academy, a vacancy is created, and up to ten candidates may nominated to fill each vacancy.

Application dates: Most offices prefer that you contact them in the spring or summer of the year prior to admission to the Academy. Congressional nominations must be submitted online by January 31 of the year of admission to the Academy.

Apply to: Both of your U.S. senators, your U.S. representative, and the Vice President of the United States. You must be a legal resident of the state and congressional district to which you are applying, but it is not necessary to know your members of Congress personally. Each office has its own procedures and deadlines for accepting nomination requests, but all offices use a competitive method to select their nominees.
In order to obtain the names of your senators and representative, please visit the following



websites: www.senate.gov and www.house.gov. From there, you can go to each member's website for specific instructions on their application process, including which office to contact.

The Governor of Puerto Rico, the resident representative from the Commonwealth of the Northern Marianas Islands, and the delegates to Congress from Guam, the Virgin Islands and American Samoa.

Puerto Rico and the Northern Marianas Islands may each have one midshipman attending the Naval Academy. American Samoa may have two midshipmen at the Academy. Guam and the Virgin Islands each may have three midshipmen at the Academy. Ten nominations are permitted for each vacancy.
Apply to: the appropriate official.

The President

An unlimited number of presidential nominations are available for children and legally adopted children of career officers and enlisted personnel of the armed forces, active or reserve, including the Coast Guard. One hundred candidates may be appointed with these nominations each year. A parent in the Reserves must be serving as a member of a reserve component and be credited with at least eight years of service (a minimum of 2880 points) or must be entitled to retired pay at the age of 60. Otherwise, the parent must be on active duty (other than for training) and have served continuously for at least eight years or have been retired with pay or granted retired or retainer pay. If you have questions regarding your eligibility, please call 410-293-4392.

Application dates: after July 1 of the year prior to admission and before January 31 of the year of admission.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office. Students must apply directly to the Academy for this nomination. Documentation requirements and a sample letter can be downloaded for completion at www.usna.edu/Admissions/documents/preslett.doc. Proper documentation to support your eligibility **must** be submitted with the nomination request.

Children of deceased or disabled veterans and children of prisoners of war or servicemen missing in action

Up to 65 midshipmen may be in attendance at the Academy based on nominations as children of military personnel who were killed in action; died from wounds, injuries or disease while on active duty; sustained 100 percent disability from such wounds, injuries or disease, as certified by the Department of Veterans Affairs; or who are currently prisoners of war (POW) or missing in action (MIA). The children of civilians in current POW or MIA status also are eligible. Legally adopted children are eligible.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office. Documentation requirements and a sample letter can be downloaded for completion at www.usna.edu/Admissions/documents/preslett.doc Proper documentation to support your eligibility **must** be submitted with the nomination request.

Children of Medal of Honor Recipients

Candidates in this special category who are fully qualified for admission are automatically appointed. There is no limit to the number of midshipmen with this source of nomination.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office. Documentation requirements and a sample letter can be downloaded for completion at www.usna.edu/Admissions/documents/preslett.doc Proper documentation to support your eligibility **must** be submitted with the nomination request.

The Vice President

At any one time, five midshipmen may attend the Academy based on a vice presidential nomination. Competition for a vice presidential nomination is extremely keen. U.S. citizens who are living outside the United States and who have not maintained a domicile in the U.S. are encouraged to apply for a vice presidential nomination.

Application dates: Must be postmarked between March 1 and October 31 of the year prior to admission. A sample letter can be downloaded for completion at www.usna.edu/Admissions/documents/vppreslett.doc.

Apply to: The Vice President, Old Executive Office Building,Washington, DC 20501, Attention: Service Academy Nominations.

Regular and Reserve Navy and Marine Corps Members

One hundred seventy appointments are available annually to regular and reserve Navy and Marine Corps enlisted personnel. For more information, see your command's career counselor or call the enlisted accessions coordinator in the Academy's Admissions office.

Reference: OPNAVINST 1420.1 or Marine Corps Order 1530.11G

Application deadline: January 31

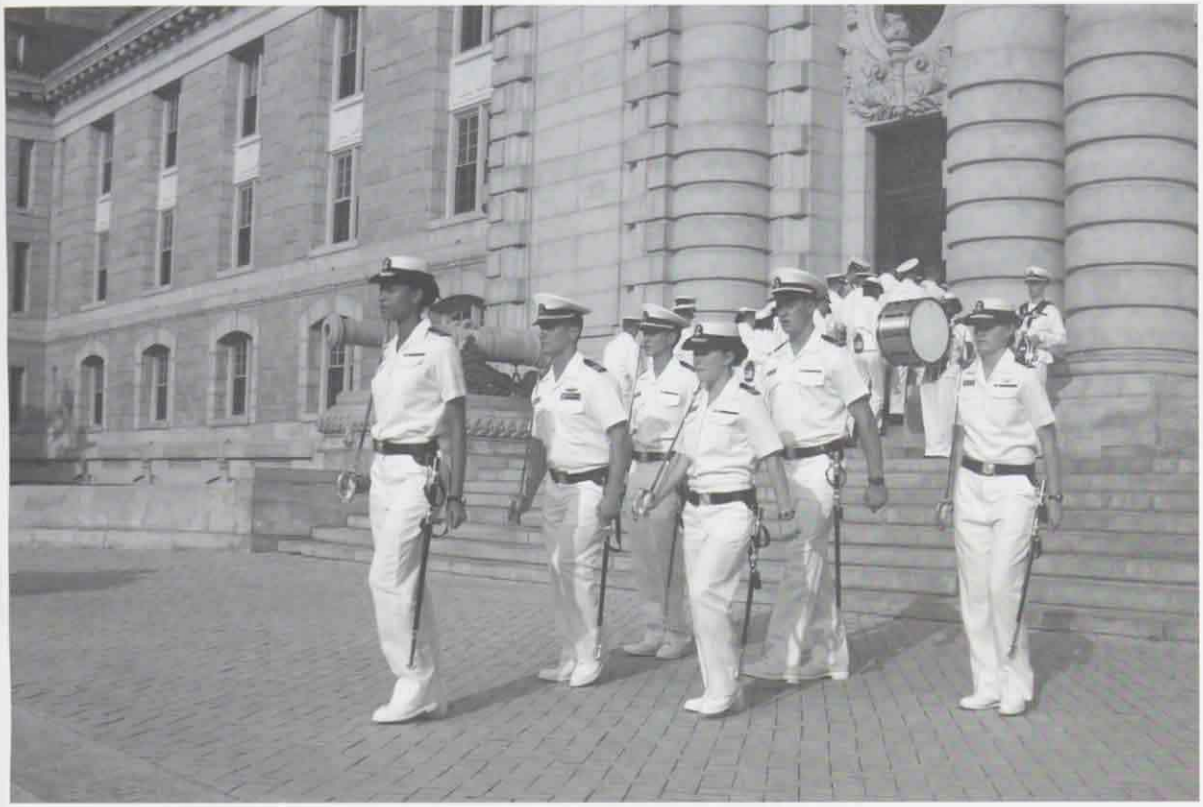
Apply to: the Naval Academy via your commanding officer.

Naval Reserve Officers Training Corps (NROTC, NJROTC, MCJROTC); Naval, Marine Corps, Air Force, and Army Honor Units with Distinction

Twenty appointments annually are available through nominations from these programs.

Apply to: your senior military instructor, professor of naval science or headmaster.

A Captain of the Navy ought to be a man of strong and well-connected sense with a tolerable education, a gentleman as well as a seaman, both in theory and in practice.
—JOHN PAUL JONES



Selection for Appointment

We use a selection process known as "rolling admissions." When all of your candidate forms are received, the Admissions Board will determine your "whole person" qualification. If your record of achievement is truly outstanding, you could receive an early offer called a Letter of Assurance. This indicates our intent to extend an Offer of Appointment, provided that all your remaining requirements (nomination, CFA, and medical) are successfully completed. A Letter of Assurance could be received as early as September of your senior year. Of course, final admission will depend on continued success and good standing in your high school as well as continuing to maintain your qualifications for the Naval Academy.

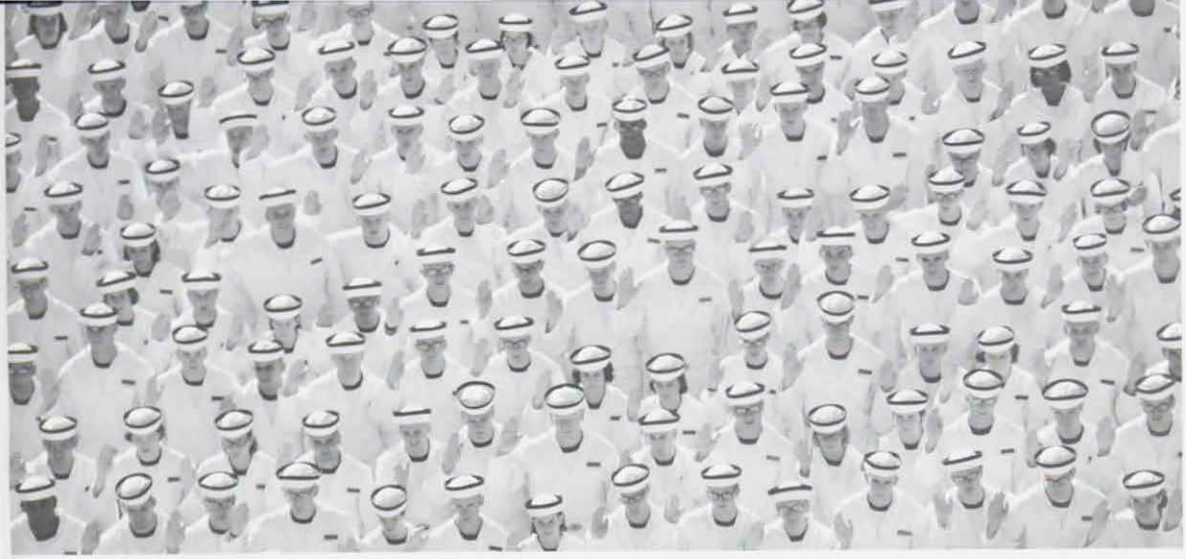
If you are found scholastically qualified but do not receive a Letter of Assurance, you will be competing for an offer of appointment from within your nominating sources. Approximately 2,000 candidates are found fully qualified (scholastically, medically, physically (CFA), and have obtained a nomination). Of that number, about 1,500 will receive appointments and approximately 1,200 become midshipmen. **Candidates will be notified as soon as possible of their status, and most will be notified by April 15. All appointees are required to notify the Admissions Office of their intention to accept or decline by May 1. Candidate files not completed by March 1 will not normally receive further consideration.**

Naval service obligation

When you accept an appointment, you will receive a Permit to Report packet (normally sent in April) with several important documents and forms to consider and complete. One of the most important is the Agreement to Serve. This agreement, required by U.S. law (Title 10, U.S. Code, Sections 6959 and 2005) and other directives, outlines your service obligation and must be signed and returned to the Academy prior to Induction Day. It requires the consent of parents or guardian if you are a minor. In signing the Agreement to Serve, you state that you will:

- complete the four-year course of instruction at the Naval Academy;
- accept an appointment and serve as a commissioned officer in the the Navy or Marine Corps. Graduating midshipmen serve on active duty for at least five years immediately upon graduation;
- serve in an appropriate enlisted grade on active duty for up to four years, or reimburse the United States for the cost of education received at the Naval Academy if you do not fulfill the conditions agreed to above.

Without a decisive Naval force we can do nothing definitive. And with it everything honorable and glorious.
—George Washington



Oath of Office

The Oath of Office, which must be signed and agreed to orally by U.S. citizens on Induction Day, states the following:

"I,_____, having been appointed a midshipman in the United States Navy, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter, so help me God."

Resignations and separations
If you enter the Naval Academy directly from civilian life, you assume a military obligation according to the Agreement to Serve. Midshipmen who do not fulfill this agreement could be transferred to the Navy or Marine Corps in an enlisted status and ordered by the Secretary of the Navy to serve on active duty for a period not to exceed four years, as provided by U.S. law, (Title 10, U.S. Code, Section 6959). However, in practice, the following policies currently apply to midshipmen who enter the academy from a civilian status:

- if you are discharged, or your resignation is accepted before the first day of classes of your second class (junior) year, you are discharged from the naval service.

- if you leave the Academy after beginning the academic year as a second-class midshipman (junior) but before the start of first class (senior) year, you are required to serve two years in an enlisted status unless you are considered physically disqualified, unfit or unsuited for military service; or authorized to provide monetary reimbursement to the government for the cost of your education received at the Naval Academy.

- if you leave the Academy after the start of first class (senior) academic year, you incur a requirement to serve three years in an enlisted status, unless you are considered physically disqualified, unfit, or unsuited for military service or are authorized to provide monetary reimbursement.

- if you refuse a commission upon graduation, your enlisted service requirement is four years, or are authorized to provide monetary reimbursement.

To ensure safety at sea, the best that science can devise and that naval organization can provide must be regarded only as an aid, and never as a substitute for good seamanship, self-reliance, and sense of ultimate responsibility which are the first requisites in a seaman and naval officer.
—Admiral Chester W. Nimitz, Class of 1905

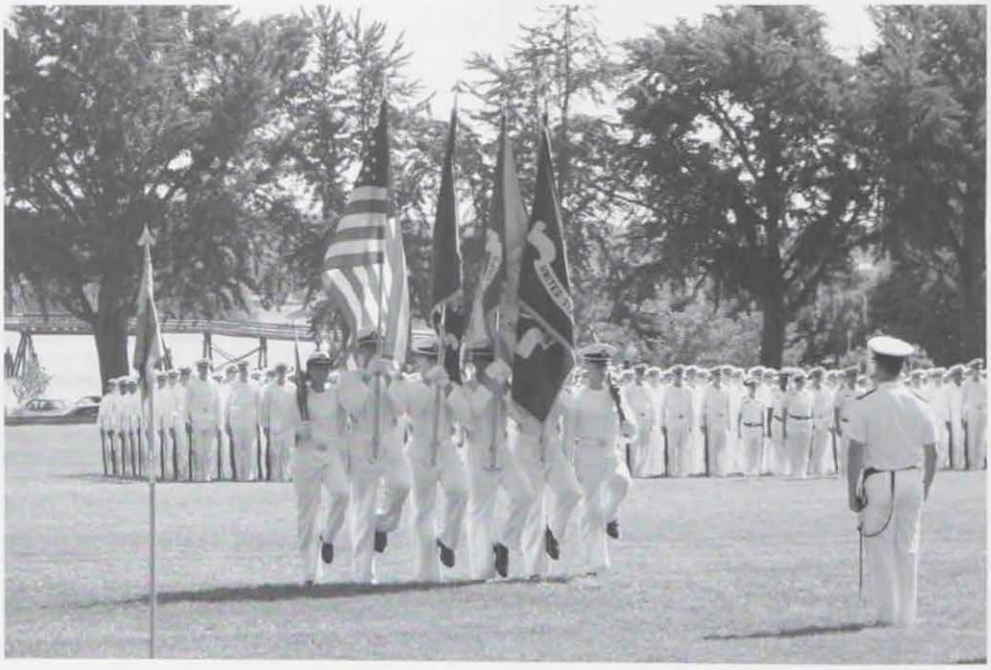
If you enter the Naval Academy or the Naval Academy Preparatory School from the Navy or Marine Corps, the remaining period of your enlistment or obligated service is not terminated when you accept an appointment to the academy. Therefore, if you do not fulfill the Agreement to Serve, you will return to enlisted status to complete the period of service for which enlisted or obligated, as provided by Title 10, U.S. Code, Section 516. In calculating the unexpired part of an enlistment or period of obligated service, time as a midshipman is counted as service under that enlistment or service obligation. However, if you are discharged or your resignation is accepted after beginning your second class academic year at the Naval Academy, you incur the same obligations described above for those who enter the academy from civilian life.

In either case, if you leave the Naval Academy after the start of your second class year or refuse a commission upon graduation and do not complete the active-duty service obligation, whether voluntarily or through misconduct, you can be required to reimburse the United States for the cost of education received at the Naval Academy. This cost is computed by the Naval Academy and includes the costs of professors' salaries, supplies and other expenses. It is comparable to the tuition at a first-rate private university. The amount to be reimbursed in a particular case varies proportionally with the period of un-served obligation, ranging up to the entire cost of your education.

Costs and financial obligations

An interest-free loan from the federal government is advanced to entering midshipmen to help defray first-year costs. This loan is repaid through monthly deductions from midshipmen pay during the first two to three years at the Academy.

If you voluntarily leave the Naval Academy before repaying these and any other obligations, you must pay the debts in full before separation. If you are separated involuntarily, you must turn in enough uniforms and equipment suitable for reissue to pay your debts.



Police Record Checks

Each candidate receiving an offer of appointment is required to complete a routine Police Record Check with his or her local law enforcement agencies. The Naval Academy will send you forms that you must take to these offices. These background checks are a precursor to the National Agency Check (NAC) that will be initiated during Plebe Summer. The Police Record Check and the NAC are used to determine your credibility and suitability for service and to grant a security clearance for access to classified material.

The possession and the use of a foreign passport in preference to a U.S. passport raises doubts as to whether the individual's allegiance to the United States is paramount. A security clearance will be denied or revoked unless the foreign passport is surrendered. Anyone who possesses a foreign passport must return the passport to the appropriate country's embassy or consulate, requesting a return endorsement. The endorsement is a prerequisite to any security clearance determination.

Induction Day Requirements

Prior to Induction Day, appointees must have proof of United States citizenship on file at the Naval Academy. Appointees without proof of citizenship on file will not be given the Oath of Office. Any of the following documents are acceptable; originals or notarized copies may be provided:

- U.S. Birth Certificate
- U.S. Passport - notarized photocopy only
- Consular Report of Birth Abroad
- Certificate of Citizenship
- Certificate of Naturalization

Reporting for Induction Day

If you accept an appointment to the Naval Academy, you will report for induction in late June or early July, take the Oath of Office and begin Plebe Summer with your new classmates from across the nation. It will be one of the most important days in your life. What you need to bring and how to make travel arrangements to Annapolis will be included in your Permit to Report packet.

If a nation expects to be ignorant and free...it expects what never was and never will be.
—Thomas Jefferson

Privacy Act Statement

The Privacy Act requires Naval Academy officials to obtain written authorization from midshipmen in order to release information on grades, performance and conduct to parents or other interested parties unless otherwise authorized by law.

Visiting the Academy

A personal visit to Annapolis can help you make a good decision about attending the Naval Academy. You and your family are encouraged to tour the Academy any day of the year during regular visiting hours. You can take a guided tour with a commercial service in Annapolis or through the Academy's own Armel-Leftwich Visitor Center. Call the Visitor Center at 800-778-4260 for guided tour schedules or visit the website at www.navyonline.com.

Our admissions staff does not conduct guided tours, but admissions officers located in Leahy Hall are available to answer your questions from 8 a.m. to 5 p.m., Monday through Friday, and from 8:30 a.m. to noon on Saturday. No appointment is necessary. USNA admissions presentations are held Monday through Friday at 9 and 11 a.m., 2 and 4 p.m. and on Saturdays at 9 and 11 a.m. The office is closed on all federal holidays.

Bancroft Hall Candidate Visitation Program

This is an invitation-only program designed for highly qualified candidates who are competitive for appointments. It is a great opportunity to spend a weekend with the Brigade of Midshipmen. During specified weekends between October and April, from 5 p.m. Thursday until 11:30 a.m. Saturday, you live with your midshipman host, attend classes, eat in King Hall and sleep in Bancroft Hall. Admissions personnel will contact qualified candidates.

Naval Academy Summer Seminar (www.usna.edu/Admissions/nass)

The Naval Academy Summer Seminar (NASS) offers an exceptional opportunity for rising high school seniors to experience the Naval Academy program firsthand for one week during the summer. This program provides a comprehensive look at the total Naval academy experience, including academic programs, life as a midshipman, physical training and Navy and Marine Corps service options. Students interested in pursuing an appointment to the academy should seriously consider attending the Summer Seminar. Midshipmen are in charge of the daily schedule and ensure each student leaves with a realistic view of academy life. This fast-paced and exciting program is attended by more than 2,200 students from around the world each year. If you want a challenging summer while exploring university-level academics and determining whether the Naval Academy will help you achieve your goals, then this program is for you.

Three one-week sessions are held during the first three weeks in June. During the six-day session you will live in Bancroft Hall (the building where all midshipmen live), eat in the dining hall, attend academic workshops and participate in daily physical training and leadership exercises. Each student attends eight 90-minute workshops, covering material from each of the 21 majors programs offered at the academy. Students will also have access to scientific labs and classrooms.

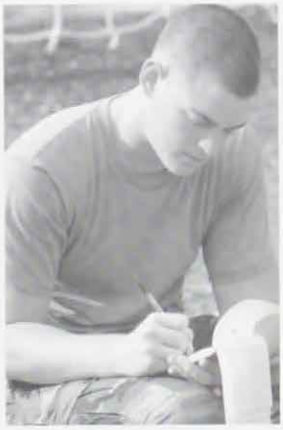
This is a competitive entry program due to the number of interested students and facility restrictions at the academy. Recognizing the academic and physical focus of the program, students should meet the following general criteria:

- possess solid academic background
- be a high school student between their junior and senior year
- be a United States citizen
- be unmarried, not pregnant, and have not incurred obligations of parenthood
- have a minimum 3.5 GPA on a 4.0 scale and rank in the top 20 percent of the class
- have taken the PSAT, SAT or ACT
- demonstrated achievement in athletics and extracurricular activities
- be physically fit and in good health
- have a positive attitude, be self-disciplined and of excellent moral character

Beginning February 1st of the applicant's junior year:

- Students may fill out an online application for NASS via the academy's webpage: *www.usna.edu/Admissions/nass.*

Selection is dependent upon the overall qualification of the student, the timeliness of their application, and our need to ensure demographic representation. There is a tuition fee for NASS which covers room and board for the week, as well as a variety of materials and T-shirts. Students are also responsible for providing their own transportation to and from the Naval Academy. Shuttle buses are provided to transport students to and from the Baltimore-Washington International Thurgood Marshall Airport (BWI).



I wasn't certain a military college was for me so I didn't come here right away. I lacked the conviction that I believe military service demands and waited instead of committing myself half-heartedly. I wasn't satisfied with my civilian experience which led me here, and I couldn't be more grateful.
—Ensign Dave Parker, Class of 2008

Alternate Routes to Admission

If you are not selected for a direct appointment to the Naval Academy, the Academy's admissions board automatically considers you for selection to the Naval Academy Preparatory School (NAPS) and/or considers you for recommendation for a Naval Academy Foundation preparatory school program. There is no separate application for these two preparatory programs.

Naval Academy Preparatory School (NAPS)

NAPS offers a nine-month college preparatory course to regular and reserve Navy and Marine Corps enlisted men and women who are seeking Naval Academy appointments. This program is designed to strengthen the academic background of incoming candidates. Navy and Marine Corps personnel who apply but are not appointed to the Naval Academy are automatically considered for admission to NAPS. The Admissions Board also identifies a number of promising and highly motivated civilian candidates who are not successful on their first attempt at admission and offers them the opportunity to enlist in the Naval Reserve for the express purpose of attending NAPS to prepare for admission to the Naval Academy. For more information, visit our webpage: *www.naps.edu.*

Students attending NAPS are encouraged to seek nominations from all sources for which they are eligible, including their congressional offices. NAPS students are also eligible for a Secretary of the Navy nomination, which will be granted by the Nominations and Appointments Office.

Naval Academy Foundation

The United States Naval Academy Foundation, Inc., also assists promising candidates who are not appointed in their first try for admission. This nonprofit organization awards a limited number of sponsorships for post-high school preparatory studies to enhance those candidates' qualifications for admission. Visit the Foundation's webpage for more information: www.usna.com.

The Foundation provides partial scholarships for those candidates whom it sponsors, but families of applicants are expected to contribute within their means. Students attending preparatory school under the sponsorship of the Foundation must obtain a nomination in order to receive an appointment to the academy.

Other Considerations

Appointment of women

Women have been fully integrated into the Brigade since Congress authorized their entry into the service academies in 1976. Women typically comprise about 20 percent of each entering class. Admissions standards are the same as those for men.

The Academy offers all midshipmen the same opportunities to excel: a challenging academic curriculum to promote intellectual development; a physical training program to build strength, agility, endurance and self-confidence; and a military environment to develop discipline, military skills and leadership. Upon commissioning, women are eligible for the same warfare specialties as men with the exception of submarines, special warfare, and Marine Corps ground combat.

Previous applicants

If you applied before but were not appointed to the Naval Academy, you may reapply for admission with a subsequent class. The application process is the same. We recommend you retake your SAT or ACT tests. If you are taking college or preparatory school courses, we suggest you take a full course load and courses similar to those required of a first-year midshipman, including calculus, chemistry with a lab and English. You will need to complete the application for the year you are applying.

Home-schooled candidates

Home-schooled students make up an increasing number of applicants for admission to the United States Naval Academy each year. You should go online and complete the preliminary application as early as spring of the year before you wish to enter the academy. Each applicant is reviewed on a case-by-case basis, but we generally look for the same academic prerequisites as traditional high school applicants. Additionally, include in your application a profile of your home school program, the accrediting agency and whether the State Board of Education recognizes the program. Home-schooled applicants should also demonstrate participation in local extracurricular activities, both athletic and non-athletic. Guidelines for home-schooled students seeking appointment to the Naval Academy are located on our website at *www.usna.edu/Admissions/sthome.htm.* More specific questions may be directed to the Naval Academy Admissions Office.

Readmission of former midshipmen

Former midshipmen desiring to re-enter the Naval Academy are eligible to apply for re-admission one year following their separation from the academy. The academy's Academic Board makes the final determination regarding the readmission of former midshipmen. Like any other candidate, you must re-qualify medically, submit recent PRT scores, and not be past your 27th birthday on July 1 of the year you would graduate from the Academy to be eligible for consideration. Requests should be addressed to the Dean of Admissions. You should **not** submit a Preliminary Application and you do not need to seek another nomination.

International students

Public Law authorizes each U.S. service academy to accept 60 exceptional international students officially sponsored by their respective governments. The Department of Defense, in consultation with the Department of State, selects and notifies the countries that may nominate candidates. Students must work with the American Embassy in their home country on the application process. Selection of nominees to attend the academy is made by the Naval Academy Admissions Board in early April each year. All international students selected for appointment will be required to participate in a mandatory cultural and English language familiarization program prior to induction. They will report to USNA approximately 10 days prior to Induction Day.

I would recommend the Naval Academy to some of my friends, yes, but not all of them. Some are better suited for the rigors and attitude of this institution than are others, which is not a positive or negative judgment, but simply evidence for the human character.
—2ND LIEUTENANT GENEVIEVE STUDER, USMC
CLASS OF 2008

Naval Academy Information (Blue and Gold) Officers

You will undoubtedly have many questions about the Naval Academy and the naval service before you make a commitment to pursue an appointment. The Admissions Office coordinates a nationwide network of trained Naval Academy Information (Blue and Gold) Officers. These officers, located in every state, are well qualified to counsel you on all aspects of the Naval Academy. The following pages list state and area coordinators can help you find the name and address of your nearest Blue and Gold Officer. We want to help you make the right decision. Therefore, several additional resources are available to help you find out all you can about the academy and the professional opportunities available to you after graduation. You may view our webpage at www.usna.edu/Admissions. In Annapolis, the Admissions Office offers detailed information about the Academy's program and admissions procedures. Call the office at 888-249-7707 or 410-293-4361.

ALABAMA

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ALASKA

Joe Zimmermann
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E-mail: joe.zimm@clearwire.net
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ARIZONA

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ARKANSAS

Captain Scott Pursley
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CALIFORNIA

Captain Brant Carter
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Captain George Wallington
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E-mail: ccwall@gv.net
Zip code areas 952-953, 956-961

Commander William Stewart
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Zip code areas 930-938

Captain Richard Estrada
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E-mail: saltyest@earthlink.net
Zip code areas 900-905, 909-916, 918, 929

Captain Myron Fleming
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E-mail: fhgt@cox.net
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Commander Nick Madigan
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E-mail: nick@alisonmortgage.com
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Captain Stephen Andres
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COLORADO

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Commander Edward Cobb
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CONNECTICUT

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DELAWARE

Commander William Soer
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DISTRICT OF COLUMBIA

Lieutenant Commander Brady Schildknecht
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FLORIDA

Dr. Richard Rapson
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Captain Frank C. Martin
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Commander Steven Swift
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Lieutenant Rod Tindal
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GEORGIA

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Lieutenant Commander Carter Edge
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E-mail: cedge@serc1.org
Zip code areas 304, 307-319, 399

HAWAII/Guam & the Pacific Islands

Captain Alma Grocki
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IDAHO

Captain Thomas F. Neville
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ILLINOIS

Colonel Kevin P. Hart
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Douglas B. Becker
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Zip code areas 609, 612-629

INDIANA

Captain Timothy Naville
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IOWA

Captain Dale L. Puhrmann
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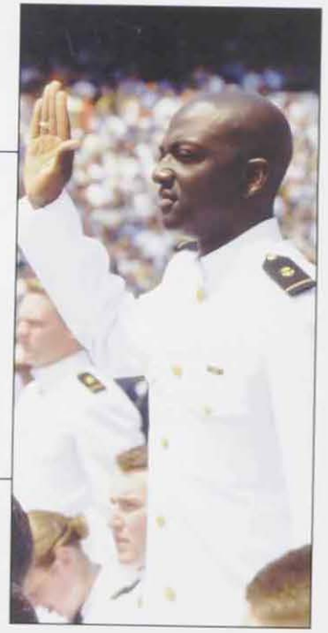
How are the four years organized?

	Plebe Summer	Fourth Class Year (Freshman)	Third Class Year (Sophomore)	Second Class Year (Junior)	First Class Year (Senior)	Graduation
Education:	Validation exams, initial academic counseling.	Required courses: calculus, chemistry, leadership, literature, history, naval science, and government. You will decide on your major course of study during the second semester of plebe year.	Required courses: mathematics, military ethics, navigation, history, physics; basic courses in major.	Required courses: electrical engineering, leadership and ethics, strategy and tactics; naval engineering; humanities elective required course for major.	Required courses: law, officer practicum, weapons systems; naval engineering, required courses for major or special study programs such as Trident Scholars.	Bachelor of science degree awarded in 22 subject areas. Seven in engineering, eight in science and math, seven in humanities and social sciences.
Professional Training:	Military orientation, officer development, seamanship, small arms (pistol), physical training.	Courses in naval science and leadership. Seminars on officer development. Hands-on experience with basic ship handling on board yard patrol craft. Indoctrination to Navy ships and aircraft and military etiquette.	Leadership experience: Third class cruise: a fleet cruise aboard a surface ship or submarine.	Leadership experience: Second class cruise training includes one week each of marine, air and submarine orientation.	Leadership experience: Directs training and activities of the brigade, including holding all leadership positions during Plebe Summer. First class cruise: 3-4 week fleet cruise in a junior officer role. Officer development seminars.	Officer commissions as an ensign in the United States Navy or second lieutenant in the United States Marine Corps.
Physical Education and Athletics:	Plebes are introduced to many of the 32 varsity sports, 15 club, and 16 intramural sports offered at the academy, ranging from football to sailing, pistol to lacrosse. Midshipmen choose a sport each season over the four years. Tests in physical readiness include sit-ups, push-ups and the 1.5 mile run.	Classes in boxing, wrestling and swimming. Physical readiness tests are administered each semester.	Instruction in martial arts, and swimming. Physical readiness tests are administered each semester.	Classes in swimming, martial arts and personal conditioning. Physical readiness tests are administered each semester.	Classes in personal conditioning and service selection specialty training. Physical readiness tests are administered each semester.	
Extra-curricular Activities (ECAs)		At USNA, recreational, professional and athletic ECAs are offered throughout the four years.		ECAs are open to all midshipmen including: Drum & Bugle Corps, Gospel Choir, Silent Drill Team, Midshipman Action Group, and Naval Academy Foreign Affairs Conference.		

Life at the Naval Academy

It would be impossible to predict what four years at the Naval Academy would be like for you personally, but we can describe our philosophy, our curriculum and the daily life you can expect. Only when you experience the exhausting rigors of Plebe Summer, only when you face the responsibility of leading other midshipmen and only when you throw your hat into the air at graduation will you really know what the Naval Academy experience is all about. Make no mistake that the four years at Annapolis are very challenging, tightly structured, and designed to push you beyond what you think are your limits. Within this framework however, there are many ways you can pursue your individual areas of interest. In this section, we will give you a general description of life at the Naval Academy. Later chapters give you the details of the academic, athletic and professional training programs.

Any healthy organization can survive individual divergencies, and may even profit from them. Compulsory unification of opinion can only achieve the unanimity of the graveyard.
—Admiral Hyman Rickover, Class of 1922

Definitions

Let's start with a few basics. On your first day at the Academy, you begin learning a whole new vocabulary of naval terms. Before long, the floor is 'the deck,' the wall is 'the bulkhead' and the restroom is 'the head.' Likewise, midshipmen seniority is stated in a way different from traditional college terms.

All Naval Academy students, men and women, are called midshipmen, which is a rank between chief warrant officer and ensign in the Navy. A midshipman first class is a senior or "firstie." The student body is the Brigade of Midshipmen, or simply 'the brigade,' and the naval service often is called 'the Fleet.' The brigade is divided into six battalions. Five companies make up each battalion, making a total of 30 companies. The midshipmen command structure is headed by a first class midshipman, chosen for outstanding leadership performance to be brigade commander. He or she is responsible for much of the brigade's day-to-day activities as well as the professional training of midshipmen. Overseeing all brigade activities is the Commandant of Midshipmen, an active-duty Navy or Marine Corps senior officer. Working for the commandant, experienced Navy and Marine Corps officers and senior enlisted lead the companies and battalions.

Living with Honor

The Honor Concept of the Brigade of Midshipmen was established by midshipmen to urge all hands to carry out their duties with the highest sense of personal integrity and honor. It represents the minimum standard that midshipmen are expected to follow. Honor, integrity, and loyalty to the service, its customs, and its traditions, are fundamental characteristics essential to a successful naval officer. Lying, cheating, and stealing are intolerable in the

Midshipmen live and work in a safe and positive environment where teamwork and mutual respect are emphasized.

The Naval Academy traditions remind me of the rich history of the Navy and how it is my obligation to do my best in order to honor those who have gone before me.
—Ensign John Hayashi, Class of 2008

brigade as in the Fleet, and may be cause for separation from the Naval Academy. The emphasis is on "doing what is right" rather than simply not breaking the rules.

To underscore their commitment to living a life of honor, midshipmen developed and implemented a living document known as the Honor Treatise of the Brigade of Midshipmen. The Treatise is a positive and uplifting statement directly from the midshipmen expressing who they are and what they are striving to achieve. It sets forth the common goals and ideals which midshipmen envision for themselves at the Naval Academy as well as in the Fleet. The Honor Concept and Honor Treatise are the brigade's way of preparing midshipmen for a life of honorable service to their country. After all, the future of the Navy, Marine Corps, and Naval Academy relies on its men and women, and their dedication to strive to do that which is right.

Four-Year Summary

The pull-out chart on the preceding page provides a diagram showing the highlights of the Naval Academy's four-year program. Each year at the academy builds on the learning and experience of the previous year. As you complete basic courses and begin advanced studies, you also take on more responsibility in leading underclassmen at Annapolis and acting as a junior officer during summer professional training with the fleet.

Life in the Brigade

No matter what your background, chances are the living arrangements at the Academy are different from anything you have experienced. The day begins with reveille and ends with "lights out." You stand watches, march to meals and wear uniforms for almost everything you do. You and your roommates must keep your room ready for a military inspection at any time and keep your uniforms in regulation condition. Demerits are awarded for a room or uniform that is not in proper order or "squared away."

All midshipmen live in Bancroft Hall, a huge dormitory complex. You are assigned to a room with one or more midshipmen and live in close proximity to about 130 other midshipmen in your company. Men and women midshipmen from all four classes make up each company. Each company has its own area called the "wardroom" for meetings and recreation. Midshipmen rooms are wired for Internet access, closed circuit TV and telephones.

Commandant of Midshipmen

Captain Matt Klunder, the 83rd Commandant of Midshipmen, graduated from the United States Naval Academy in 1982. He is an accomplished Naval Aviator with an accumulated 5,800 flight hours while flying over 45 different aircraft. Captain Klunder has served as Commanding Officer of the "Liberty Bells" in Japan, as well as Commanding Officer of Carrier Air Wing TWO. He holds a Master's degree in Aerodynamics and Aviation Systems from the Univ. of Tennessee, and an additional Master's degree in Strategic Studies from the National War College. As Commandant of Midshipmen, he oversees the professional development and day-to-day lives of the Brigade of Midshipmen.

"An appointment to the United States Naval Academy is an extraordinary accomplishment, and is the first step in joining a proud tradition of leadership and honorable service to our great nation. The U. S. Naval Academy will provide you with a distinguished academic education, superior athletic opportunities and an unparalleled character and leadership development experience. We will provide you the foundation and all the necessary tools to lead the men and women of our future Navy and Marine Corps team.

As a Midshipman, you will be held to the highest standard of conduct, honor and integrity in every aspect of your daily life. You will develop morally, mentally and physically, and be exposed to a focused leadership environment that only the U. S. Naval Academy can provide. Your summers will be spent in various locations around the world, gaining experience in the fleet with our Navy and Marine Corps team. Whether you are flying off of an aircraft carrier, steaming across the seven seas, transversing the ocean depths or serving in the field with our Marines, you will experience first hand the exciting opportunities that await you upon graduation and commissioning.

The Naval Academy is a unique experience that will develop and ultimately test your honor, courage and commitment. The challenge is great but the opportunities are limitless. We invite you to accept this journey and improve your life and that of your country."

The company is the most important unit of the more than 4,000-member Brigade of Midshipmen. Many of your most rewarding experiences at the Naval Academy are those you share with members of your company. You eat, sleep, study, drill, play and compete as teams with your company mates. You learn to trust and rely on each other. The company experience also gives you an idea of how things work in the Navy and Marine Corps, where small-unit cohesion, teamwork and morale are as important in peacetime operations as in combat. Each year, companies compete for the title, 'Color Company,' the best in the brigade. The year-long color competition among the 30 companies is one way company spirit is built. Companies accumulate points for academic, professional and intramural excellence. The company with the most points is recognized at the Color Parade during Commissioning Week and then enjoys special privileges for the next year, including the honor of representing the Naval Academy at official functions such as presidential inaugurations.

On September 11, 2001, I remember watching thick, black smoke rising from the Pentagon, just a few miles from my high school in Virginia. I had always known I wanted to serve in the military, but seeing my country come under attack made it even more certain. It made me realize that you should feel compelled to serve.
- Ensign Mackenzie White, Class of 2007

I wouldn't give up the plebe summer for anything in the world. I formed relationships and friendships for the rest of my life. We would die for each other.
MIDSHIPMAN CHELSEA WRIGHT, CLASS OF 2010

Plebe Summer

All midshipmen begin the four-year program with Plebe Summer, a period designed to turn civilians into midshipmen. Plebe Summer is no gentle easing into the military routine. Soon after entering the gate on Induction Day, you are put into uniform and taught how to salute by the first class midshipmen who lead the plebe indoctrination program. For the next seven weeks, you start your days at dawn with an hour of rigorous exercise and end them long after sunset, wondering how you will make it through the next day. Forget television, leisure time or movies. You will have barely enough hours in the day to finish your assigned plebe tasks!

The frantic, exhausting pace of Plebe Summer leads you somewhere. It gets you ready for your responsibilities when the brigade returns from summer training and the academic year begins. The summer also builds the foundation for the tangible and intangible qualities that make an outstanding naval officer. You learn self-discipline. You learn to organize your time and decide which things are most important. You reach top physical condition. You develop your ability to think clearly under stress and to react quickly when the unexpected comes your way. Any officer who has stood the watch on the bridge of a ship in a storm or landed a jet on the deck of an aircraft carrier at night can tell you the importance of these qualities.

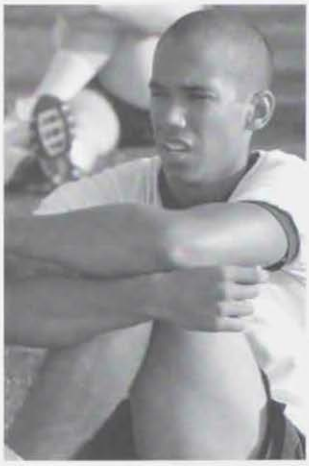
Plebe Summer introduces you to the basic how-to's of the Navy as well. Aboard Naval Academy sailboats, you learn to respect the power of wind and current. You learn the basics of seamanship, navigation and boat handling. On the weapons range, you learn how to fire small arms safely and accurately. You also learn why we have high standards of honor, character and conduct. And, you begin to develop your own ideas about leadership and the techniques that will make you an effective leader.

Academic Year

When the upperclassmen return to the academy in late August to begin the academic year, you begin a routine that becomes very familiar during your four years. A typical weekday schedule looks something like this:

5:30 a.m.	Arise for personal fitness workout (optional)
6:30 a.m.	Reveille (all hands out of bed)
6:30 - 7:00 a.m.	Special instruction period for plebes
7:00 a.m.	Morning meal formation
7:15 a.m.	Breakfast
7:55 - 11:45 a.m.	Four class periods, 50 minutes each
12:05 p.m.	Noon meal formation
12:10 p.m.	Noon meal for all midshipmen
12:50 - 1:20 p.m.	Company training time
1:30 - 3:30 p.m.	Fifth and sixth class periods
3:45 - 6:00 p.m.	Varsity and intramural athletics, extracurricular and personal activities; drill and parades twice weekly in the fall and spring
6:30 - 7:15 p.m.	Supper
8:00 - 11:00 p.m.	Study period
Midnight	Taps for all midshipmen

When you add to this schedule the time required for military duties, inspection preparation and extra academic instruction, you can see the demands on your time are considerable.



Leadership Responsibility

As you progress through the years at the academy, leadership responsibilities grow. Each year, you and your classmates assume more important roles in running your company, your battalion and the brigade. By the time you are a first class midshipman, you are making daily decisions affecting the morale and performance of other midshipmen. You are teaching them the fundamentals of the naval profession and helping them through difficulties. You are leading through personal example, ability, authority and techniques you learned in the classroom and through three years experience. Your leadership responsibilities also increase in summer professional training, culminating as a junior officer during your first class summer cruise.

You build your leadership skills in these and other settings, where you can learn from mistakes and benefit from the guidance of seasoned officers and senior enlisted. By the time you take your position as a naval officer responsible for leading Sailors and Marines, you have had practical leadership experience and in developing teamwork to accomplish goals and objectives.

At a young age I realized that a life of service dedicated to the Marine Corps was something I wanted, because accomplishing things for yourself isn't really satisfying. What's really satisfying is serving others. That's the best way to spend your life.
- Ensign Jade Baum, Class of 2007

Spiritual Opportunities

The copper-green dome of the Chapel towers over the other buildings in the Yard at the Naval Academy and, in a sense, serves as a symbol of the academy to the outside world. This is more than a coincidence. Over the decades of our history, fighting Americans have learned by experience that there is a dimension to military leadership — both in and out of combat — that is essential to real effectiveness. This is the spiritual factor, the intangible quality we call moral courage.

It is this aspect of the academy's mission that the Religious Ministries Program strives to fulfill: to foster spiritual fitness and promote the moral development of the midshipmen within the tenets of an individual's personal faith or belief. The Chaplain Center serves the religious and spiritual needs of the brigade by ministering to the midshipmen through pastoral care, spiritual and religious mentoring, ritual and sacramental obligations and by providing pastoral care for all, regardless of their faith background.

The academy embraces freedom of religion in all that we do. This means allowing our midshipmen to worship or not as they desire while placing no requirements on midshipmen to embrace specific beliefs or participate in specific religious events. At the same time we provide support for a wide variety of religious beliefs so those midshipmen who desire to worship are free and able to do so for their own personal moral development.

While attendance at religious services is voluntary, midshipmen are reminded that as officers of the naval service, their personal beliefs will often be tested, and that in time of stress their subordinates will look to them for spiritual, as well as professional guidance. The Naval Academy has long believed that future officers owe it to themselves and to those they will lead to gain insights into moral, ethical and spiritual dimensions of military leadership. Further, we want to make sure our midshipmen understand the responsibilities they will have as officers in ensuring religious support for their Sailors and Marines no matter the nature of their beliefs. Not only do we want our midshipmen and young officers to respect the beliefs and practices of those who follow a different religion or hold beliefs different from their own, we want them to understand and embrace their need as officers to ensure their Sailors and Marines can attend services and receive religious support aboard ship or on the battlefield. From the first day of Plebe Summer until the day of commissioning four years later, the academy's chaplains serve and minister to the spiritual needs of the Brigade of Midshipmen. Chaplains are actively involved in a host of Brigade activities, provide personal counseling, ranging from faith-centered issues through crises of life and death, to future marriage plans.

Recreation

All midshipmen are encouraged to take part in one of the academy's many clubs and extracurricular activities. For plebes especially, these activities help to relieve the stress of academics and the tough military routine. After plebe year, your free time increases. You may relax, pursue personal interests, date and explore the local area. There's much to see and do in Annapolis, Baltimore and Washington, D.C. There also are many cultural, social and sports activities sponsored by the Academy.

Spectator Sports

On autumn weekends, the excitement and color of Navy football sweeps the brigade. All midshipmen attend home games in the nearby Navy-Marine Corps Memorial Stadium. The football season ends with the entire brigade cheering on the team in the traditional Army-Navy game. There are 31 other varsity Navy teams to cheer on as well. Outstanding spectator facilities bring out enthusiastic Navy supporters for almost every rivalry from wrestling and swimming to lacrosse, basketball, soccer and baseball.

Plebe Sponsor Program

During Plebe Summer, every midshipman is introduced to an Annapolis-area family that has volunteered to host midshipmen for dinners, local sightseeing, recreation and simple relaxation away from the demands of the Yard. Many sponsor relationships last long beyond the academy years.

Social Events

The Brigade Activities Committee plans several special weekends during the year, including events like the annual International Ball with young guests from foreign embassies in Washington, D.C. Midshipmen groups also plan and participate in theatrical events, concerts and dinners. Senior naval officers join midshipmen regularly for traditional mess nights featuring formal rules of order, formal toasts, skits and good-natured fines. Individual companies of midshipmen often organize their own special activities on weekends. Certainly the highlight of our social calendar is Commissioning Week in May—five days of dances, garden parties, parades, concerts and a Blue Angels flight demonstration all culminating in graduation and commissioning of the first class midshipmen.

The Naval Academy is a great atmosphere. I've made a lot of good friends and built a lot of great relationships. It's been wonderful working with people who are so dedicated and professional.
- Midshipman Zakary James Bishop, Class of 2011

Cultural Affairs Program

We take advantage of our proximity to Washington, D.C. and Baltimore to arrange tickets and transportation to cultural events in those metropolitan areas. Plays, symphonies, operas and ballets at Washington's Kennedy Center and other theatres are open to midshipmen from all classes.

With the Bob Hope Performing Arts Center at Alumni Hall, the Naval Academy is able to provide a wide variety of theatrical and concert events to midshipmen. The Distinguished Artists Series, which presents performers of international renown, is the centerpiece of the program. Masqueraders productions, musicals, glee club concerts, chapel organ recitals, music concerts, Naval Academy Band concerts and chamber music recitals round out the action-packed year of events on the Yard. Many other cultural activities, including poetry readings and lectures by leading American authors, are offered at the academy.

Extracurricular Activities

Even with a midshipman's demanding academic and athletic schedule, you will have time for extracurricular activities (ECAs). The following are some of the Naval Academy's current ECAs.

Amateur Radio Club
American Institute of Aeronautics & Astronautics
American Nuclear Society
American Society of Mechanical Engineers
Art Club
Association of Computing Machinery
Astronomy Club
Baptist Student Union
Black Studies Club
Campus Crusade for Christ
Campus Girl Scouts
Cannoneers
Catholic Choir
Catholic Midshipmen Club
Cheerleading
Chemistry Club
Chess Club
Chinese American Club
Churchill Society
Color Guard
Debate
Dolphin Club
Drum & Bugle Corps
Fellowship of Christian Athletes
Fencing Club
Filipino American Club
French Club
German Club
Glee Club Musical
Golden Key National Honor Society
Gospel Choir
Institute of Electrical and Electronic Engineers
International Midshipmen
Japanese American Club
Jewish Midshipmen Club
Joy Bright Hancock Group
Judo
Jui Jitsu
Korean Midshipmen Club
Labyrinth
Latin American Studies Club
Latter Day Saints
Lucky Bag (yearbook)
Marine Technology
Masqueraders
Math Club
Midshipman Action Group
Men's Glee Club
Model United Nations
Muslim Midshipmen Club
National Eagle Scout Association
National Society of Black Engineers
National Society of Collegiate Scholars
Naval Academy Aviation Squadron
Naval Academy Foreign Affairs Conference
Navigators
Oceanography Club
Officers' Christian Fellowship
Omicron Delta Epsilon
Paintball
Phi Alpha Theta
Phi Kappa Phi
Physics Club
Pi Sigma Alpha
Pipes & Drums
Protestant Choir
Protestant Midshipmen Club
Semper Fidelis Society
Sigma Tau Delta
Silent Drill Team
Socratic Society
Society of American Military Engineers
Society of Automotive Engineers
Society of Hispanic Professional Engineers
Society of Naval Architects and Marine Engineers
Society of Naval Engineers
Society of Women Engineers
Surface Navy Association
Tau Beta Pi
Team Bill
Team Philo
Trident Brass
Upsilon Pi Epsilon
Women's Glee Club
WRNV (Radio Station)
YP Squadron
USNA Parachute Team
Infantry Skills Team
Rock Climbing Team
USNA Special Operations Team
Scuba Club
Midshipmen String Ensemble
Mountaineering Club
Equestrian Club
ALLIES (Alliance Linking Leaders in Education and the Services)
Adventure Racing
Combat Arms team
Midshipmen Group Study Program
Italian Midshipmen Club
Trident Newspaper
LOG Magazine
Russian Studies Club
Shooting Club
Alpine Ski Team
Brigade Media Production Group
Middle Eastern Studies Club

"Our Country's Good" performed by the Masqueraders, the midshipmen theatrical group

The Gospel Choir performs during the Wesley A. Brown Field House Dedication

Members of the Midshipman Action Group traveled to Nigeria during the summer to help construct a school

Keeping my experiences in the context of broader, less immediate goals helps me remain focused and excited about my future. Few environments will facilitate and require as much teamwork among friends. At the end of the day most experiences are really about the people.
—2ND LIEUTENANT DAVE PARKER, USMC
CLASS OF 2008

Local and Area Attractions

The Naval Academy adjoins historic downtown Annapolis, which is famous for its state capitol, colonial homes and waterfront. The city dock is the focal point of the Annapolis waterfront. Workboats outfitted for harvesting crabs and oysters berth next to million-dollar sailing yachts and power boats. During mild weather, the dock is the scene of concerts, boat shows and festivals mixing midshipmen and local citizens with thousands of tourists. For a small city of 40,000, Annapolis is very sophisticated, offering many fine restaurants, boutiques, art galleries, museums, a repertory theater and a symphony orchestra. Several large shopping centers and malls are located in the suburbs.

Maryland's largest city, Baltimore, is approximately 30 miles from Annapolis and the Naval Academy. Baltimore's Inner Harbor offers a wide variety of specialty shops, eateries and entertainment. The Maryland Science Center and the National Aquarium are also there. Greater Baltimore also has theatres, galleries, museums and a zoo. For sports enthusiasts, a professional indoor soccer team, a minor league hockey team, the Orioles baseball team and the Ravens football team provide sports excitement.

Due west of Annapolis lies Washington, D.C., our nation's capital. Washington is home to the Smithsonian Institution with its museums of Natural History, National Gallery of Art, American History and Air and Space. There are hundreds of other attractions ranging from art galleries, symphonies, opera, ballet and off-Broadway theatre to rock and jazz concerts, ethnic festivals and scenic parks. Washington also has its share of professional sports teams including the Redskins in football, the Nationals in baseball, the Wizards in basketball and the Capitals in ice hockey.

Midshipmen Pay and Benefits

The Navy pays for the tuition, room and board, medical and dental care of Naval Academy midshipmen. You also enjoy regular active-duty benefits including access to military commissaries and exchanges, commercial transportation and lodging discounts and the ability to fly space-available in military aircraft around the world. Midshipmen pay is $894.30 monthly, from which laundry, barber, cobbler, activities fees, yearbook and other service charges are deducted. Actual cash pay is $100 per month your first year, which increases each year therafter.

Since I was young I was interested in the military. Then, when I went on a few missions to Mexico and I realized how lucky I was to live in the United States and wanted to give something back to my country. Now I know it's such a blessing. I'm serving my country and doing what I love.

- Midshipman Chelsea Wright, Class of 2010

Leave and Privileges

The Naval Academy's combined academic, military and physical development programs demand a lot of effort, requiring you to spend more time on campus than the typical civilian college student. But midshipmen enjoy Christmas and summer vacations (leave) plus shorter periods of time off (liberty). Free time to be away from the Academy is based in large part on assigned military responsibilities, performance in academic and military endeavors and class seniority. All midshipmen generally are granted leave during these periods:

- Thanksgiving leave;
- an end-of-semester leave;
- mid-term leave during spring semester;
- a short liberty period at the end of spring semester and before Commissioning Week;
- three weeks of summer vacation

During semesters of the academic year, off-campus privileges fall into two categories: town liberty and weekend liberty. Weekend liberty permits you to take an overnight away from the Academy during the weekend, returning before the Sunday evening meal. You are not eligible for weekend liberty if you are assigned a military duty/watch (rotated responsibilities) or if you are having serious difficulty in academics, conduct or military performance. Town liberty curfews differ according to seniority. Generally, town and weekend liberty is authorized for midshipmen as follows:

- Plebes have town liberty on Saturdays (noon to midnight) and yard liberty within the Naval Academy complex on Sundays.

One day in high school, my dad talked to me about joining the service. He was in the Marine Corps. When I was a child and my father was in the Marine Corps, he took me to a Blue Angels show and that has always motivated me here at the Naval Academy. I figured it was the best way to accomplish my goal of becoming an aviator in the military. Also, being the oldest child, I wanted to set a good example for my younger brothers.

- Midshipman Jordan Emmons, Class of 2009

- Town liberty is granted for upperclass midshipmen in accordance with class weekends.

- A limited number of overnight weekends are granted to upperclass midshipmen based upon class.

Motor Vehicles
Restrictions apply to your use of motor vehicles as a midshipman. This is necessary because parking space is very limited at the Academy and in Annapolis. Also, you have limited time off in the first years to make use of a private vehicle. These are the current rules:

- Third-class midshipmen and plebes are not permitted to operate motor vehicles except when authorized leave, such as during Christmas vacation.
- Second-class midshipmen may have a car but must maintain and operate it beyond Academy grounds.
- First-class midshipmen may drive a car in Annapolis and on the Naval Academy.
- No midshipman is allowed to maintain or operate a motorcycle.

I was three years old when saw an F-14 Tomcat for the first time and I decided then I wanted to fly for the Navy. The Naval Academy has prepared me to achieve that dream after all these years.
-Ensign Thomas Bell, Class of 2008

Alcohol and Drugs
As a future naval officer, you are expected to not abuse alcohol and to shun illegal drugs entirely. Plebes, regardless of age, are not allowed to consume alcoholic beverages. As an upperclass midshipman, you may drink if you are the minimum legal age for drinking (21 in Maryland). If you choose to drink alcohol, the Naval Academy will provide social occasions where responsible use of alcohol is permitted, such as at an official reception. The use of illegal drugs is strictly forbidden and results in expulsion from the Academy. As a midshipman, you are subject to random drug testing through urinalysis, consistent with Navy-wide policies and procedures.

Prevention and Deterrence of Sexual Harassment and Assault
The Naval Academy does not tolerate sexual harassment or assault. Our goal is to prevent sexual assault from occurring through comprehensive education and awareness training. Academy staff and faculty seek to provide the safest possible learning environment for midshipmen by maintaining a professional command climate that promotes dignity and respect and by implementing a dynamic, proactive training program. The Academy programs are consistent with those in the Fleet and Marine Corps.

The Sexual Assault Victim Intervention program provides training to the Brigade of Midshipmen through an extensive four-year curriculum that covers a broad range of topics such as date rape awareness, prevention and intervention. Midshipmen are also educated on victim support, victim's rights, and the medical and legal aspects of sexual assault cases. Various guest lecturers, specializing in the topic of sexual assault awareness and deterrence, provide further education throughout each year. Midshipmen are expected to exercise responsibility in preventing and deterring unacceptable behavior from occurring, and to conduct themselves as officers with character.

In the rare event that an incident does occur, the Academy has created an environment that encourages victims to come forward by providing multiple paths of reporting, twenty-four hour on-call support, prompt response to allegations, and immediate protection for the victim. All victims of sexual assault are treated with fairness and respect. Key members of the Naval Academy's staff ensure the sensitive, coordinated and effective handling of sexual assault cases involving midshipmen, including referral to a victim

advocate, counseling, and medical services. All allegations are thoroughly investigated and perpetrators are held accountable, under due process afforded by the Uniform Code of Military Justice.

Services

Almost everything you need as a midshipman is available on the Academy grounds. There's a bookstore, uniform and tailor shop, cobbler shop, snack bar, barber/beauty shop, post office and recreation rooms. We also provide the following services:

Dining

The entire brigade eats at one time in a 55,000-square-foot dining area or wardroom, King Hall. Companies sit together, and food is served family style during the week. Other meals are served buffet style. King Hall offers a wide variety of healthy choices to ensure midshipmen have the proper sustenance for their high metabolisms. All of the food for the 12,000 meals served daily is prepared by our food service staff in the kitchens adjacent to King Hall.

Medical Care

Modern facilities for medical treatment are conveniently located at the Naval Academy. Besides routine medical treatment, orthopedics/sports medicine, podiatry, physical therapy, preventive medicine and optometry services are available. Specialists in gynecology, dermatology, neurology, cardiology and urology schedule visits to the Academy. Consultation and treatment including inpatient care, in all major medical and surgical specialties are available at several military treatment facilities, such as Bethesda and Walter Reed Medical Hospitals. Most emergency conditions are handled at nearby Anne Arundel Medical Center, a fully accredited civilian facility in Annapolis.

Dental Care

Comprehensive oral health care is provided by the Dental Clinic conveniently located in Bancroft Hall. The professional staff provides the full range of dental hygiene and general dentistry treatment. The specialties of Oral Surgery, Orthodontics (limited), Endodontics, Periodontics and Prosthodontics are also available.

Midshipmen Development Center

A wide variety of training, educational and clinical services are provided to promote and enhance the adjustment, well-being, and professional development of midshipmen, including confidential individual and group counseling.

Legal Assistance

The Office of Legal Counsel is available to assist midshipmen with personal and military legal questions.

Financial Advice

Regular seminars offer information on savings, loans, insurance programs, investment opportunities and tax returns. Individual financial counseling is available from a Navy Supply Corps officer who serves as midshipmen financial advisor.

Right now, I would fly a cardboard box if it had wings on it. I feel the Naval Academy has prepared me for whatever challenges I might face in the future. It has been everything that I thought it would be. It has been extremely tough, but I would do it again.
- Ensign Rick Wilson, Class of 2007

The Sea Trials are tough, endurance-wise, but with everyone working together, you don't really think about it. It's a tough first year, but I got through it and I can't complain.
- Midshipman Eric Brugler, Class of 2011

Academic and Professional Education

The relationship between officers and men should in no sense be that of superior and inferior nor that of master and servant, but rather that of teacher and scholar.
— General John A. LeJeune, USMC, Class of 1888

To prepare midshipmen as Naval officers, the Naval Academy's curriculum blends professional subjects with required and elective courses similar to those offered at leading civilian colleges. Our curriculum has three basic elements:

- core requirements in engineering, natural sciences, the humanities and social sciences, to assure that graduates are able to think, solve problems and express conclusions clearly;

- core academic courses and practical training to teach the professional and leadership skills required of Navy and Marine Corps officers; and

- an academic major that permits a midshipman to explore a discipline in some depth and prepare for graduate level work.

Accreditation

The Naval Academy is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market St., Philadelphia, PA 19104, (215) 662-5606. The Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Commission on Recognition of Post-secondary Education. In addition, six of the Naval Academy's engineering majors are professionally accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The computer science major is accredited by the Computing Accreditation Commission of ABET, and the chemistry major is accredited by the American Chemical Society.

Degree Awarded

Upon graduation, a bachelor of science degree is awarded regardless of major, by law, due to the technical content of the core curriculum. Those in the top 10 percent of their class graduate with distinction. Those who have completed special honors programs in one of six selected majors graduate with honors.

Academic Dean and Provost

Dean William Miller returned to his alma mater as the sixth Academic Dean and Provost in October 1997; he is the chief academic officer at the Naval Academy. Dean Miller graduated from the Naval Academy in 1962 and, during his 31-year Navy career, served as a Surface Warfare Officer and a leader in the Navy's research and development programs. As a surface warfare officer, Dean Miller commanded a frigate and a destroyer. As a researcher, Dean Miller served as the Chief of Naval Research, Commanding Officer of the Naval Research Laboratory, and founding director of the Navy's Low Observables (stealth) Technology office. After retiring from the Navy, Dean Miller served from 1993 to 1997 as the Associate Provost for Research and Economic Development at West Virginia University where he co-founded the Benedum Center for Education Reform and the Institute for Software Research. He holds masters and doctor of philosophy degrees in Electrical Engineering from Stanford University.

"The Naval Academy has a long, proud tradition of educating and training leaders for the greatest challenges of national service. We prepare our graduates to lead the nation's sailors and Marines immediately upon graduation. We also provide a firm foundation of knowledge at the baccalaureate level on which our graduates can later build the specific expertise they will need for their career progression. The careers on which Naval Academy graduates embark demand individuals who can think critically, analyze complex problems, speak and write articulately, and faithfully support the values of their service and their nation.

The foundation of the academic program at the Naval Academy is our core curriculum. Taught by one of our nation's finest undergraduate faculties in first class facilities, the core curriculum ensures all graduates receive a comprehensive, intellectually challenging education which prepares them to tackle a diverse array of complex problems. It is in our core curriculum that midshipmen develop the professional competence necessary for any of our graduates to succeed in any available career field in the Navy or Marine Corps.

The Naval Academy also offers each midshipman a selection of 22 majors in disciplines as diverse as engineering, math, the physical sciences, the humanities and the social sciences. Each of these majors contributes to the development of a strong educational foundation necessary for our graduates to excel in their immediate responsibilities and in future studies. Some majors have been rated by independent national authorities as among the best of their discipline in the country.

Most importantly, in the Naval Academy's academic program, we seek not only to educate our midshipmen, but to substantially contribute to the development of their character. Through consistently high standards of performance, a demanding curriculum and a stimulating learning environment, we develop leaders characterized by self-discipline, initiative, determination and a commitment to life-long learning. The academic program complements the professional training, character development and the physical education components of the Academy program to produce these critical leadership qualities. With its comprehensive core curriculum, outstanding majors program, and emphasis on character development, I believe the Naval Academy is producing outstanding leaders for tomorrow and the next millennium."

Educational Philosophy

The Naval Academy's philosophy of education stresses attention to individual students by highly qualified faculty members who are strongly committed to teaching. It's hard to get lost in the classroom at the Naval Academy. Classes are small, with an average size of about 18 students. Even the core courses required of all midshipmen are divided into small sections, so that midshipmen receive individualized attention from instructors. In science and engineering courses, the same professor who lectures in the classroom supervises experiments in the lab. This contrasts sharply with most universities, where scholars may address their students in huge lecture halls, but direct contact with undergraduates in labs or discussion sections is delegated to graduate assistants. All courses at the Naval Academy are taught and graded by faculty members, not by graduate assistants.

Faculty

Our 560-member faculty is an integrated group of officers and civilians in nearly equal numbers. This composition is unique among service academies. It dates from the earliest days of the Naval School when three civilian teachers joined four Navy officers in the first faculty in 1845. Officers rotate to the Academy for two-to-three-year assignments, bringing fresh ideas and experiences from operational units and staffs of the Navy and Marine Corps. They can also explain how studies at the Academy are applied in the fleet and the field. A small cadre of officer faculty who have doctorates add another dimension to the teaching staff as Permanent Military Professors. The Academy's civilian faculty members give continuity to the educational program and form a core of professional scholarship and teaching experience. Nearly all of these civilians have doctoral degrees, and many of them are recognized as leading scholars in their fields. Working together closely, these military and civilian faculty members form one of the strongest and most dedicated teaching faculties of any college or university in the United States. Although many faculty members are involved in scholarly research and writing, their first priority always is teaching.

Let us think of education as the means of developing our greatest abilities, because in each of us there is a private hope and dream, which, fulfilled, can be translated into benefits for everyone, and greater strength for our nation.
—John F. Kennedy

Faculty Senate

Founded in 1993 as a consolidation of two earlier faculty organizations, the United States Naval Academy Faculty Senate's primary purpose is to advise the administration on faculty and curriculum matters. With a membership of approximately 30, the Senate is composed of representatives, both military and civilian, from the various academic departments and divisions. Typically, the Senate meets twice a month during the academic year, conducting most of its business based on reports from the various committees and subcommittees.

An important goal of the Senate is to improve Yard-wide communication. As a result, senior Academy administrators are ex-officio members of the Senate, addressing the membership on issues of major concern.

Academic Advising

Midshipmen receive as much help as they need in planning their academic programs. The academic advising system has two stages. During Plebe Summer each company of plebes is assigned two faculty members, either military or civilian, to act as academic advisers. Each plebe receives academic counseling including basic study skills information prior to the commencement of the academic year. Advising continues throughout the year as often as necessary. When a major is selected in the spring of plebe year, a midshipman is assigned a permanent faculty adviser from the academic department of that major. Professors and company officers are extremely helpful in providing academic counseling and advice to midshipmen.

Core Curriculum

In four years at the Naval Academy, you are required to take certain core courses to make sure you are well prepared for the major career-path options available to Navy and Marine Corps officers. Majors courses also prepare you for advanced professional training and postgraduate education, which are expected of nearly all naval officers. Through required courses in engineering, natural sciences, social sciences, the humanities, professional military subjects and physical education, the Naval Academy gives midshipmen a balanced education to open practically any door of opportunity in the future.

During plebe or freshman year, all courses are required. The required courses form the foundation for the more advanced courses chosen by upperclass midshipmen. Some core requirements in the upperclass years have alternative courses from which to choose, depending on your academic background, abilities and major.

The typical academic schedule for plebes includes five courses in each of two semesters:

Plebe year, first semester — 16 credit hours

- Calculus I — Most begin here, some validate and are placed into later calculus courses and a few plebes not adequately prepared for calculus take a pre-calculus course that does not count as part of the minimum mathematics requirement.

- Chemistry I — Including laboratories.

- U.S. Government and Constitutional Development — The foundation of American democracy.

- Leadership and Human Behavior – An examination of the fundamentals of leadership within the context of individual and group behavior.

- Rhetoric and Introduction to Literature I — Some plebes take a practical writing course to prepare for this class.

- Fundamentals of Naval Science — The basic elements of shipboard operation, organization and propulsion.

Plebe year, second semester — 18 credit hours

- In addition to these courses taken for credit, a few hundred plebes who have had little exposure to computers are provided with six weeks of training.

- Calculus II — Continuation of the first-semester course.

- Chemistry II — Continuation of the first-semester course.

- American Naval Heritage — A history of this country's Navy.

- Introduction to Navigation

- Rhetoric and Introduction to Literature II.

Whenever it gets tough, I just remember the thousands that have gone before me that managed to get through the very same challenges. There is stress built into life here, not to crush us, but to make us that much stronger.
—Ensign Chris McCook, USN, Class of 2007

Advanced Placement

More than half of those entering the Naval Academy validate one or more courses. Each of the academy's academic departments sets its own validation standards and considers one or more of the following:

- transcripts;
- department validation tests, administered at the Naval Academy; and
- College Entrance Examination Board Achievement and Advanced Placement tests.

During Plebe Summer, all entering midshipmen take placement exams in English, mathematics and science. Individual midshipmen may elect to take placement exams in other discipline areas such as chemistry, economics, history, physics, political science and foreign languages. Excellent performance on the placement exams may result in a midshipman validating courses and thus accelerating portions of their academic program. Over four years, this may permit the student to reduce the number of courses taken in a particular semester, or become eligible for special academic programs, for honors programs or for graduate programs. It may allow a student to complete a minor, or take courses that might not otherwise fit into the standard academic schedule.

Most placement exams are scheduled during the first two weeks of Plebe Summer. Midshipmen should arrive at the Naval Academy prepared to take these very important examinations. Following the evaluation of the exam results, each plebe will receive academic counseling from a faculty adviser to help the student understand his or her performance on the examination and subsequent placement in a particular level or section of a course.

In any case, midshipmen must take a minimum of 15 credit hours each semester and spend a total of four years in residence at the Naval Academy, excepting Service Academy Exchange and Study Abroad programs, to complete professional courses and training.

Majors Program

At the Naval Academy, the academic program is focused on science, technology, engineering, and mathematics (STEM) in order to meet the current and future highly technical needs of the Navy. Graduates who are proficient in scientific inquiry, logical reasoning and problem-solving will provide an officer corps ready to lead the Navy in all of the diverse naval and Marine Corps warfare communities all around the world.

While the majority of midshipmen will choose their majors, the needs of the Naval Service take precedence and by the Class of 2013, at least 70% of Naval Academy and NROTC graduates must complete academic majors in the science, technology, engineering, or mathematics disciplines. At the end of plebe year, midshipmen choose a major course of study with counsel from academic and military advisors.

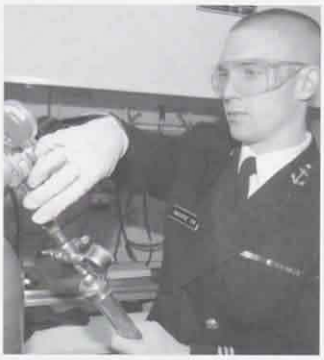
Twenty-two majors are offered:

- Aerospace Engineering
- Arabic
- Chemistry
- Chinese
- Computer Science
- Computer Engineering
- Economics
- Electrical Engineering
- English
- General Engineering
- General Science
- History
- Information Technology
- Mathematics
- Mechanical Engineering
- Naval Architecture
- Ocean Engineering
- Oceanography
- Physics
- Political Science
- Quantitative Economics
- Systems Engineering

Some of these areas offer additional specialization within the major. For example, recognizing that the Navy is an important user of space vehicles and satellites, the Naval Academy created an astronautics track within the aerospace engineering major to help prepare midshipmen for assignments involving space technology systems. Minors in French, German, Spanish, Russian and Japanese are offered to those who complete four advanced courses in one of these languages while at the academy.

Special Academic Opportunities

Students who excel at the Naval Academy have many opportunities to challenge and advance themselves through several special programs.



Trident Scholars
The Trident Scholar Program provides an opportunity for some exceptionally capable midshipmen to engage in independent study and research during their senior year. Following their selection to the program during their junior year, first class scholars conduct year-long independent research in an area of their interest, working closely with a faculty advisor who is an expert in the field. Trident Scholars carry a reduced formal course load to give them sufficient time for in-depth research and for preparation of a published thesis. Trident Scholars often also report their findings in national conferences related to their field. Current Trident Scholars come from many different majors and are researching topics that range from "Analysis and Optimization of Vortex Oxidizer Injection in a Hybrid Rocket Motor System" to "Search for Galactic Asymmetry: Developing a Star Count Model of the Galaxy" to "Design, Synthesis and Testing of Anti-malarial Compounds Based Upon a Novel Chemical Lead."

Bowman Scholar Program
The Bowman Scholar Program provides an opportunity for a small group of Naval Academy midshipmen, who are seeking initial service assignments in the nuclear Navy, to compete for appointments as Admiral Frank Bowman Scholars. Prior to their selection, candidates are screened for the Navy's nuclear power training pipeline by the Director, Naval Reactors. If selected for nuclear power training and subsequently appointed as a Bowman Scholar, the Scholar participates in a tailored research internship during one of the summer training blocks preceding first class year and then participates in a special research-based learning opportunity during his or her last year as a midshipman. During the first year of commissioned service after graduation, Bowman Scholars will likely be offered immediate, one-year graduate education experiences resulting in a master's degree in a technical discipline. Class of 2009 Bowman Scholars will be tackling research projects that range from "Material Alternatives for Rapid Metal Prototyping of Military Components" to "Analyzing the Mixed Radiation Field Environments of Naval Aviators and Aircrew" to "Alternate Biometric Algorithm Processing Using Parallel Logic in Field-programmable Gate Arrays."

Honors Program
Midshipmen with excellent academic and leadership performance can apply for honors programs offered in history, English, political science, mathematics, oceanography, systems engineering, and economics. Honors students complete a thesis or research project and orally defend it before a panel of faculty members. Successful participants graduate with honors.

Voluntary Graduate Education Program (VGEP)
Midshipmen who have completed Academy course requirements early through any combination of validation and overloading can compete for selection and begin work toward master's degrees at nearby civilian universities, such as the University of Maryland and Johns Hopkins University Applied Phyiscs Laboratory. Up to 20 midshipmen can participate annually, starting graduate work during first-class (senior) year and completing their master's degree programs within seven months after graduation from the Naval Academy. Fields of study are selected from Navy-approved graduate education programs leading to Navy subspecialty qualification.

Some call this place a fraternity. It is, and the best kind. We live by the mantra "Ship, Shipmate, Self," and when the going gets tough, there's always someone who will drop whatever he or she is doing to help you out.
—2nd Lieutenant Genevieve Studer, USMC, Class of 2008

Naval Academy International Program Office
The Naval Academy is committed to developing foreign language and regional knowledge as a third institutional core competency, along with ethical leadership and a strong technical foundation in science, math, and engineering. To provide a more coherent approach to developing midshipman international awareness, the Naval Academy established an International Program Office (IPO). The IPO serves as the principal point of contact, central coordinating office, and source of expert assistance for all international engagement (foreign travel, visitor coordination, student and faculty exchanges, etc.) conducted at the U.S. Naval Academy or by USNA personnel. The majority of the IPO effort is focused on developing and maturing opportunities to reinforce midshipman capabilities in foreign languages and regional knowledge associated with Navy and Marine Corps theater security cooperation activities and priorities. Examples include semester study abroad at foreign military academies and civilian universities, summer education and cultural immersion opportunities, professional training aboard foreign navy gray hull or training sail ships or short duration orientation visits. At least 25 percent of each class of midshipmen will have a significant language or cultural awareness experience during their four years along the Severn.

Facilities

From wind tunnels to a state-of-the-art chemistry labs, we have outstanding facilities and equipment in every phase of our program. Classrooms, labs and athletic facilities provide modern and comfortable areas for learning and recreation.

The following are only some of the special academic facilities available:

- propulsion lab
- wind tunnels, both subsonic and supersonic
- 120-foot and 380-foot towing tanks
- coastal engineering basin
- environmental chamber facilities
- oceanographic research vessel, field laboratory and weather station
- 16-inch Cassegrain reflector telescope
- fully-equipped laboratories for chemistry, physics, engineering, oceanography and foreign language courses
- 12-meter satellite earth station

Computers
The United States Naval Academy has been an educational leader in the use of computer technology since the 1960s. Today it is considered one of the most wired, advanced, and forward-looking information technology campuses in the nation, highlighted by a system of multimedia (voice, video, and data) networks. A fiber optic, scalable, high-speed enterprise backbone, with a system of tailored virtual local area networks (vlans), is dedicated to every building, office, conference room, classroom, and laboratory. This network also supports Bancroft Hall, the midshipmen's dormitory. Literally hundreds of miles of fiber, copper, and coax wiring posture our networking with unlimited expansion capability. The network provides Intranet and Internet access, multi-media capabilities, thin client applications, intelligent tools, and reliable integrated desktop technologies, on demand, to support teaching and learning, research, and social use. All 1,950 midshipmen rooms are fully networked supporting 24/7 video and data communications to each midshipman desk. Midshipmen are well equipped to profit from this environment. Prior to the beginning of their first academic year, all plebes receive an advanced fully multimedia desktop microcomputer with a suite of communications, administrative, and academic software. The Naval Academy considers information technology to be a mission critical resource, a strategic initiative, and a core competency. Consequently information is embedded in every USNA function in all user-driven products and resources. All

midshipmen must purchase a Naval Academy-specified personal desktop microcomputer and software during Plebe Summer. After introductory training, midshipmen use their personal computer in most academic courses and professional development.

A page of history is worth a book of logic.
—Admiral Hyman Rickover, Class of 1922

Nimitz Library

Built in 1973, the Library includes a collection of more than 600,000 volumes of books and bound periodicals, plus government documents, microforms, audiovisuals, extensive holdings of manuscripts and archival materials in Special Collections and Archives, and a growing array of electronic resources. Special emphasis is on naval science and history. The Library's website, including its web catalog and an extensive number of electronic journals and databases, is accessible via the Academy's network from the midshipmen's dorm rooms and faculty offices. Comfortable reading and study areas can accommodate more than 800 students. The Library also contains seminar and group-study rooms, as well as two electronic classrooms.

Writing Center

Open to all midshipmen, the Writing Center exists to help those needing extra writing instruction. The Writing Center is staffed by English department faculty members, both civilian and military, who are experts in composition and in working with students to improve their writing skills.

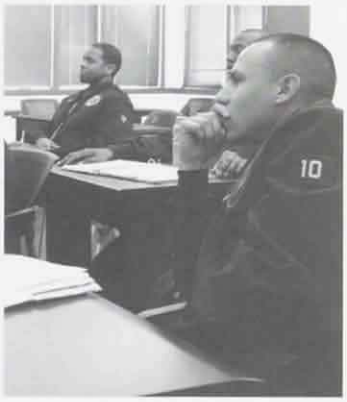
Math Lab

The Math Lab is available to midshipmen to supplement meetings with their own instructors. Staffed with faculty members of the Mathematics Department, the Math Lab provides assistance in all core mathematics courses to midshipmen without prior appointments throughout the academic day.

Academic Center

All midshipmen have access to the Academic Center, which offers academic advising services and learning skills classes. Students who encounter academic difficulty during plebe year are referred to the Academic Center where they receive special academic advising, academic effectiveness classes and tutoring. A series of learning skills classes, including topics such as time management, note taking, effective reading, test taking and how to cope with challenges, is offered several times a year for interested midshipmen. The Academic Center coordinates the Plebe Advising Program where faculty members serve as the advisors for a company of plebes during both plebe summer and academic year.

As part of the Academic Center, the Midshipmen Group Study Program (MGSP) provides an opportunity for midshipmen to study with others taking the same course, to compare notes, to discuss important concepts, and to develop strategies for studying. Groups are directed by midshipmen who have done well in the course and are trained in leading others. The program provides assistance in chemistry, calculus, physics, statics/dynamics and several other courses.



Multimedia Support Center

The Multimedia Support Center (MSC) is the Naval Academy's audio-visual service. Midshipmen and faculty use the services of MSC to enhance teaching and learning at the Academy. MSC's facilities include graphics arts and computer presentation assistance, video audio-visual equipment loans, video-teleconference support, classroom display system intallation/maintenance and video broadcasting.

Resources Afloat

The fundamentals of seamanship, navigation and naval operations are taught in laboratories afloat on our many sail and power craft. The Robert Crown Center on the Severn River supports many of these activities, as well as recreational, intercollegiate and offshore sailing. The Naval Academy's large and varied fleet includes:

- 20 108-foot yard patrol craft;
- 24 44-foot sloops;
- 9 30- to 66-foot ocean racing yachts;
- 1 J/22; 1 Sonar;
- 22 420 dinghies, 2 Interclub dinghies, 6 Tech dinghies;
- 22 FJ dinghies;
- 30 Navy 26 keelboats; and
- 60 Lasers

The Naval Academy's sailing program is truly comprehensive. It ranges from basic instruction to advanced intercollegiate dinghy and international-level, open-ocean racing. All midshipmen participate in sailing during Plebe Summer receiving sailing instruction in sloop-rigged keelboats.

Ours is a maritime nation, requiring the most powerful navies to protect our free rights to the farthest reaches of the seas.
—Lyndon B. Johnson

After Plebe Summer, midshipmen may try out for either the Intercollegiate Dinghy Team or the Varsity Offshore Sailing Team. Both racing programs are highly competitive and are consistently top-ranked nationally. Midshipmen may also participate in the academy's Offshore Sail Training Squadron (OSTS). This program prepares them to sail one of the Academy's 44-foot sloops offshore during summer cruise, and those who master the skills required will qualify as a Cruising Skipper or Senior Offshore Skipper (the Navy "D" Qual).

Professional Courses and Training

Professional courses and training are an important part of the Naval Academy's integrated program. Required courses in such areas as naval science, engineering, navigation and weapons systems give you a working knowledge of modern naval operations and technology. Courses in leadership, ethics and military law help prepare you for leadership responsibilities as an upperclass midshipman and a commissioned officer. Physical education teaches you the value of physical fitness and staying fit for life. Eight weeks of annual summer training introduces you to operational units of the Navy and Marine Corps, life at sea and the responsibilities of a junior officer.

Courses available as electives include leadership and psychology. Also available are extracurricular programs such as the Yard Patrol Craft Squadron.

It cannot be too often repeated that in modern war, and especially in modern naval war, the chief factor in achieving triumph is what has been done in the way of thorough preparation and training before the beginning of war.
—Theodore Roosevelt

Academic Year Courses and Training

Fourth Class (Plebe) Year

Professional courses — three required introductory classes in naval science and leadership. Courses include classroom studies and lab sessions in operational trainers and afloat in yard patrol craft.

Infantry drill — about 13 hours of infantry drill in the fall and spring, including four hours in the Brigade of Midshipmen dress parades.

Physical education — the Physical Education Department is tasked with accomplishing one third of the mission of the Naval Academy, to prepare midshipmen physically to become professional Navy and Marine Corps officers. This mission is accomplished through a thorough and rigorous course of instruction in the fundamentals of swimming, personal defense, lifetime fitness and recreational sports, and through the regular administration of the Physical Readiness Test. Midshipmen must meet physical education requirements during their four years at the Naval Academy in order to graduate. The following is graded for plebes:

- Swimming — 100-meter crawl stroke; 50 meters using the breaststroke and elementary backstroke (seven to 11 strokes per 25 meters); 5-meter tower jump; 40-foot underwater swim; 200-meter swim (five minutes, 12 seconds maximum).
- Boxing — midshipmen are awarded grades based on proper form, offensive and defensive techniques, fortitude and ring craft during a competitive bout against an opponent of the same size, experience and gender.
- Wrestling — midshipmen are awarded grades based on takedowns, rides, pins, escapes, reversals and aggressiveness during a competitive wrestling bout against an opponent of the same size, experience and gender.

Third Class Year

Professional courses — two required in navigation, ethics and moral reasoning

Infantry drill — about 13 hours in the fall and spring, including dress parades.

Physical Education

- Swimming — 400-meter swim (11 minutes maximum); 50-meter sidestroke (seven to 11 strokes per 25 meters); 10-meter tower jump; clothing (trouser) inflation in three minutes; 50-foot underwater swim fully clothed.

- Martial Arts I — midshipmen are awarded grades based on execution of the martial arts skills; breakfalls, upper and lower body strikes, counters to strikes, counters to front and rear assaults, sweeps, throws, offensive and defensive ground fighting, weapons fighting and a physically challenging culminating event.

Second Class Year

Professional courses — five are required, including courses in naval warfare, naval engineering and weapons. Also required are naval electricity and electronics and a leadership course that focuses on the dynamic interactions of leader, followers, and situation.

Infantry drill — about 13 hours in the fall and spring, including dress parades.

Physical education

- Swimming — graded 1000-meter to 1800-meter swim in 40 minutes, fully clothed. Clothing (trousers only) inflation in two minutes.
- Personal conditioning/wellness-fundamental knowledge for a lifetime of health and physical fitness.
- Martial Arts II — midshipmen are awarded grades based on execution of advanced martial arts skills; advanced breakfalls, counters to strikes, counters to front and rear assaults, chokes and joint locks and counters, edged weapons, unarmed vs armed pistol, sweeps, throws, offensive and defensive ground fighting, weapons fighting and a physically challenging culminating event.

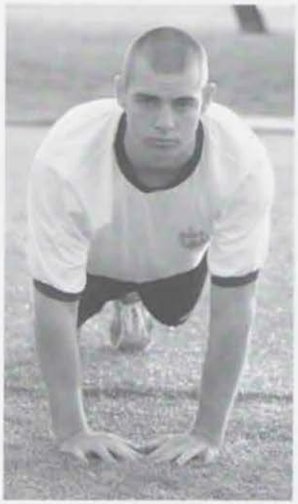
First Class Year

Professional courses — the three required courses are a control systems lab relevant to warfare systems, a law course covering military justice and the law of war, and a junior officer practicum aligned with service assignment plus an engineering course.

Infantry drill — leading the brigade in about 13 hours of drill, including dress parades.

Physical education

- Electives — opportunity to acquire skills in a lifetime carry-over activity (15 electives). Electives are offered in the first and second semester of the first class year in 15 lifetime carryover sports/activities: first aid, fitness, golf, water polo, racquetball, squash, tennis, volleyball, kayaking, gymnastics, weight training, advanced martial arts, swim conditioning, an introduction to climbing, and advanced climbing. All physical education subjects are graded, and midshipmen must pass all subjects in order to graduate.



In addition to the above requirements, all midshipmen are regularly required to pass the *Physical Readiness Test.* The PRTconsists of push-ups, curl-ups, and a 1.5 mile run. The PRT is administered each semester all four years.

- 1.5 mile run — maximum time for men: 10:30. Maximum time for women: 12:40.
- Push-ups and curl-ups — Men: minimum to pass in two minutes; 45 push-ups, 65 curl-ups. Women: minimum to pass in two minutes; 20 push-ups, 65 curl-ups (sit-ups).
- Sit and reach, touch toes in sitting position.

Summer courses and training

Plebe summer

This starts on Induction Day in late June. Areas of emphasis include military indoctrination, physical education, basic seamanship and sailing, small arms training, first aid and introduction to personal computers. See page 42 for more on Plebe Summer.

Third class summer

In the summer between your plebe and third class years, you will report to Navy ships and submarines around the world. You become part of the crew for four weeks, taking part in drills, gunnery exercises and standing watches underway. This experience gives you first-hand knowledge of the daily routine of the Navy at sea. You also learn to appreciate the talents, responsibilities and perspectives of enlisted men and women you will later lead as officers. Additionally, you will spend four weeks either onboard a USNA Yard Patrol craft to various East Coast ports or as part of the crew on a 44-foot Naval Academy sailboat open ocean sailing in the challenging environment on the Eastern seaboard.

Second class summer

During the summer before your second class year, you are introduced to every major branch of the Navy and Marine Corps. In one action-packed summer, you fly Naval aircraft, dive in a nuclear-powered submarine, experience life in Surface Warfare, and take part in combat training with the Marine Corps.

First class summer

In the final summer, you get the chance to put your leadership skills to the test, both in the Fleet and at the Academy. For four weeks, you join an operational unit, and this time your duties are those of a junior officer. Depending on your career interests and qualifications, you can choose a surface warship, submarine, aviation squadron, SEAL Team, or an Explosive Ordnance Disposal Unit. Those midshipmen interested in choosing the Marine Corps after graduation may attend a four-week training course in Quantico, Va. Selected midshipmen may attend a four-week training course in Quantico, Va. You will also showcase your leadership skills as part of the Plebe Summer Detail or hold a leadership position on a YP Craft or sailing cruise.

Other summer training opportunities

USNA also offers summer school for those midshipmen seeking to make up for previous unsatisfactory performance in the classroom or to get ahead in curricular requirements for their major. Summer school is normally done in lieu of taking leave and is not designed to replace Fleet training requirements.

The International Programs Office supports overseas summer training and language study abroad by midshipmen. Additional, exciting travel opportunities exist under Language, Regional, Experience, and Culture (LREC) programs as well as exchange cruises on ships of foreign navies.

Being a Plebe Summer cadre was profoundly rewarding. Its nature of providing me the occasion as a squad leader to directly influence the perspective, attitude, and training of eleven individuals—to whom I will soon entrust the care of this institution, and more importantly the lives of enlisted Marines and Sailors—brought me to better understand the importance of attitude, accountability, integrity, teamwork, followership, and example.
—2ND LIEUTENANT GENEVIEVE STUDER, USMC, CLASS OF 2008

Leadership Development

The purpose of the United States Naval Academy is to provide the naval service with leaders of character who will serve the nation in peace and war. The Academy has a deep and abiding commitment to the moral development of its midshipmen and to instilling the naval service core values of honor, courage and commitment. The goal of the Leadership Development Division is to integrate the moral, ethical and character development of midshipmen across every aspect of the Naval Academy experience. The integrated leadership development program is the single most important feature that distinguishes the Naval Academy from other educational institutions and officer commissioning sources. Elements of the leadership development program include:

• *Admission Candidate Statements and Recommendations.* Candidates for admission are required to write an essay on a significant character-developing experience that they have had, and teachers completing recommendations for candidates are specifically asked to comment on the character and integrity of candidates as compared to their peers.

• *Plebe Summer Training.* Many hours of training during Plebe Summer lay the foundation for character and leadership development as a midshipman. Twelve hours of classroom education are provided to assist the entering class to understand their obligations and responsibilities as a future commissioned officer in the profession of arms and includes topics such Officership, duty, and honor.

• *1/C Officership Capstone Seminars.* Four years of Leadership Development programs culminates in a Officership Capstone Seminar. This seminar is dovetailed with the academic courses in leadership and moral reasoning taught throughout the midshipman's four years at the academy. The goal of this seminar is to support the mission of the Naval Academy by providing first class midshipmen the opportunity to discuss some complex ethical and moral issues. Topics are discussed in small groups, which include a mix of midshipmen and staff/faculty members. The seminar gives each first class midshipman a valuable opportunity to test his or her thoughts, and challenges those of their peers. This experience is enhanced by input from faculty and staff members in addition to interested alumni, who have experienced similar situations either as commissioned officers in the fleet or civilian professionals who can provide valuable insight from a non-military view not otherwise considered, but important to understand when making a decision. The seminars provide a forum in which midshipmen ideas and solutions to fleet-related problems can be tested. In addition

to topics appropriate to their future commissioned service, a guest speaker is invited to add an experienced perspective. Each first class midshipman is required to attend one of these day-long seminars that are offered numerous times throughout the academic year. These seminars are funded by private donations from the Elliott family and the HERO Campaign for Designated Drivers in memory of their son, Ensign John Elliott, Class of 2000.

• *Honor Remediation Program.* The midshipmen who are found in violation of the Honor Concept but retained by the Commandant or Superintendant are placed into a comprehensive honor remediation program. This program places the midshipman under the mentorship of a senior officer for a designated period, usually four months. This introspective period requires readings and personal reflection on honor, extensive discussions with the mentor, participation in community service, and completion of a written thesis.

• *Character Development Speakers Program.* During Plebe Summer, prominent speakers from the Navy and Marine Corps are brought in to talk about the naval service core values of Honor, Courage, and Commitment. The Naval Service Core Values Speakers program enables the new class to interact with such prominent leaders as the Chief of Naval Operations, the Commandant of the Marine Corps, former astronaut James Lovell, former Secretary of the Navy James Webb, former Vietnam era POWs, current veterans of Operation Enduring Freedom and Operation Iraqi Freedom and others.

The daily routine demands a blend of practical application to classroom techniques that is truly a work-study environment at its finest. I've never felt inhibited by the curriculum or deprived in any sense. Instead I'm given opportunity to regularly make decisions that amount to the best leadership training available.
—2ND LIEUTENANT DAVE PARKER, USMC, CLASS OF 2008

Grading

Grades have an added dimension at the Naval Academy in that they affect your status and privileges as a midshipman. As the major determinant of class rank, they also influence ship selection or advanced training scheduling following service assignment and seniority upon graduation and commissioning.

We use a letter grading system with these values, called quality point equivalents, or QPE:

A = 4.0 (Excellent)
B = 3.0 (Good)
C = 2.0 (Satisfactory)
D = 1.0 (Marginally passing)
F = 0.0 (Failing)

Grades are averaged using a weighted semester hour system called the quality point rating or QPR. Your QPR is figured by multiplying the QPE received in each course by the semester hours of credit for the course. That total is divided by the total number of hours completed in the semester. You earn semester QPRs and a cumulative QPR (CQPR) based on all of your grades.

Midshipmen must maintain a cumulative QPR of 2.0 or above or they risk academic probation or dismissal. As required by law, the Academic Board reviews the records of academically deficient midshipmen. Midshipmen subject to academic discharge are those who fail two or more courses; have a semester QPR below 1.5; fail to remove academic probation; are two or more courses behind in the matrix of the assigned major; do not fulfill a requirement previously assigned by the Academic Board; or do not complete all graduation requirements by the end of the first-class year.

Grades in military performance, conduct, physical education and summer professional training are not included in the QPR, but they are figured into class standing. Satisfactory performance in professional areas is required.

Recognition of Excellence

Three honor categories recognize midshipmen with outstanding academic and professional records:

Superintendent's List — midshipmen with semester QPR of at least 3.4 and no grade of D, F, I; grades of A in military performance, A in conduct and A or B in physical education.

Dean's List — midshipmen not on the Superintendent's List with semester QPR of 3.4 and no grade of D, F, I in any academic course; grades of at least a B in military performance, B in conduct and at A, B, or C in physical education.

Commandant's List — midshipmen with semester QPR of at least 2.9, grades of at least B in military performance, A in conduct and B in physical education.

Honor societies

A number of national scholastic honor societies are represented at the Naval Academy. Midshipmen who excel academically may be recommended for membership in these societies:

Omicron Delta Epsilon — international honor society for economics. Midshipmen candidates for election to the Naval Academy chapter need not be economics majors but must have an overall scholastic average of B and at least twelve credits in economics with a B average or better.

Phi Alpha Theta — international honor society for history. Membership includes both faculty and students who participate in forums and seminars, also hosting guest speakers and regional meetings of the society.

Phi Kappa Phi — for superior scholarship in all fields of study. Up to six percent of the midshipmen of each class may be chosen to join, half during their second-class year and half in first-class year.

Pi Sigma Alpha — national honor society for political science. To be eligible for membership, midshipmen must stand in the upper one-third of their class with a B or better average in at least 15 hours of political science courses.

Phi Sigma Iota — international honor society for foreign languages. To be eligible for membership, midshipmen must have an overall B average, a B average in foreign language courses and have completed advanced courses in foreign languages.

Pi Tau Sigma — national mechanical engineering honor society. Midshipmen majoring in mechanical engineering who stand in the upper third of their class as seniors or the

upper fifth as juniors are eligible for membership.

Sigma Pi Sigma — physics honor society, affiliated with the American Institute of Physics and the American Association for the Advancement of Science. Midshipmen candidates for membership must have completed three semesters of physics with at least a B average and must be in the upper one-third of their class in general scholarship.

Sigma Tau Delta — national English honor society. To be eligible for membership, midshipmen must be in the upper third of their class with at least a B average in advanced English courses.

Sigma Xi — scientific research society that encourages original investigation in the fields of pure and applied science. The Naval Academy chapter includes members from the professional staffs of the academy and the Annapolis laboratory of the Naval Surface Warfare Center.

Tau Beta Pi — national engineering honor society. The top fifth of senior engineering majors and top eighth of junior engineering majors are eligible for membership.

Upsilon Pi Epsilon — international honor society for the computing sciences. To be eligible for membership, midshipmen must have a minimum of a 3.0 QPR overall and a 3.25 QPR in computer science courses.

Graduation Requirements

To be eligible to graduate, you must:

- complete at least 137 academic credit hours, including core requirements in engineering, natural sciences, humanities and social sciences;
- complete the courses required in your chosen major;
- achieve a final cumulative quality point rating (CQPR) of at least 2.0, a C average;
- meet required standards in professional studies and at-sea training;
- meet required standards of military performance, conduct, honor and physical education; and
- accept a commission in the Navy or Marine Corps, unless one is not offered.

Awards

Outstanding midshipmen are recognized publicly during Commissioning Week. A number of organizations and individuals sponsor more than 200 prizes and awards honoring midshipmen for excellence in academics, professional studies, leadership, and athletics.

Since I was young I was interested in the military. When I went on a few missions to Mexico, I realized how lucky I was to live in the United States and wanted to give something back to my country. Now I know it's such a blessing. I'm serving my country and doing what I love.
—Midshipman Chelsea Wright, Class of 2010

Advanced Education

Postgraduate education is encouraged for all naval officers and is practically a requirement in today's Navy and Marine Corps, which operate very sophisticated systems in a changing, complex world. Nearly all graduates go to advanced professional training en route to their first duty assignments. New Marine Corps officers go to The Basic School at Quantico, Va. Navy ensigns go to nuclear power school, flight training or other schools, depending on their chosen specialty and the nature of their first assignment. Professional training continues throughout your career. There also are several ways for Naval Academy graduates to earn advanced academic degrees besides the Voluntary Graduate Education Program (VGEP) discussed on page 61. Most officers are automatically considered for graduate school as they complete their first duty assignment. If selected, they can enter master's degree programs at the Naval Postgraduate School in Monterey, Calif., or at an approved civilian university.

Midshipmen with outstanding academic records can compete for a number of scholarships for postgraduate school right after graduation from the Naval Academy or after an initial operational assignment. There's also a program for up to 15 graduates a year who want to combine careers in medicine and the Navy. To prepare for this program, midshipmen usually major in chemistry and then enter civilian or armed forces medical schools soon after graduation and commissioning.

Under all circumstances, a decisive naval superiority is to be considered a fundamental principle, and the basis upon which all hope of success must ultimately depend.
—George Washington

The following graduate education programs are currently available:

Navy Burke Program (Junior Line Officer Advanced Educational Program) — open to 15 qualified graduates in each class for study toward a master's degree in science or engineering. These studies, usually at the Naval Postgraduate School, begin after one operational tour of two to four years.

It is an experience unlike any other. I have yet to find anything else that truly forces you to step out of your comfort zone as much. I believe that if you are always comfortable, you are probably not improving. In which case, what is the point of education?
—Ensign Erica Reid-Dixon, USN, Class of 2008

Marine Corps Burke Program — open to 15 graduates from each class who enter the Marine Corps. Graduate study begins approximately two years after commissioning. Selectees may choose their field of study from an extensive list of disciplines.

Olmsted Foundation Scholarships — established by the George and Carol Olmsted Foundation in cooperation with the Department of Defense. These scholarships support two years of graduate education at foreign universities, using foreign languages, for Navy and Marine Corps officers. Two Naval Academy graduates who have served between three and eleven years of active duty are eligible each year.

Naval Academy graduates may qualify for a number of immediate scholarships awarded for study at civilian colleges and universities. These graduate studies can be pursued in various fields while graduates receive pay as commissioned Navy and Marine Corps officers. Up to 20 members of each class can begin postgraduate studies under these scholarships immediately after graduating from the Naval Academy. Such scholarships include:

Rhodes and Marshall Scholarships for two years of graduate study in any field leading to a master of arts or master of philosophy degree — at Oxford for the Rhodes Scholarship or at any university in the United Kingdom for the Marshall Scholarship — with all expenses provided for study and travel. Forty-five midshipmen have won the Rhodes Scholarship since 1930, when Navy participation began. There have been nineteen Marshall scholars since 1981.

Gates Cambridge Scholarships for two years of graduate study at Cambridge University in England.

William H.G. FitzGerald Scholarship — supports two years of graduate study at Oxford University in England for one Naval Academy graduate each year.

Thomas Pownall Scholarship — supports two years of graduate study at Cambridge University in England for one Naval Academy graduate each year.

Otto A. Zipf Scholarship — supports two years graduate study at the Ruprecht-Karl University of Heidelberg, Germany, for one Naval Academy graduate of each class.

Truman Scholarship for graduate study in any major, with emphasis on public service. Up to four midshipmen are nominated during their junior year.

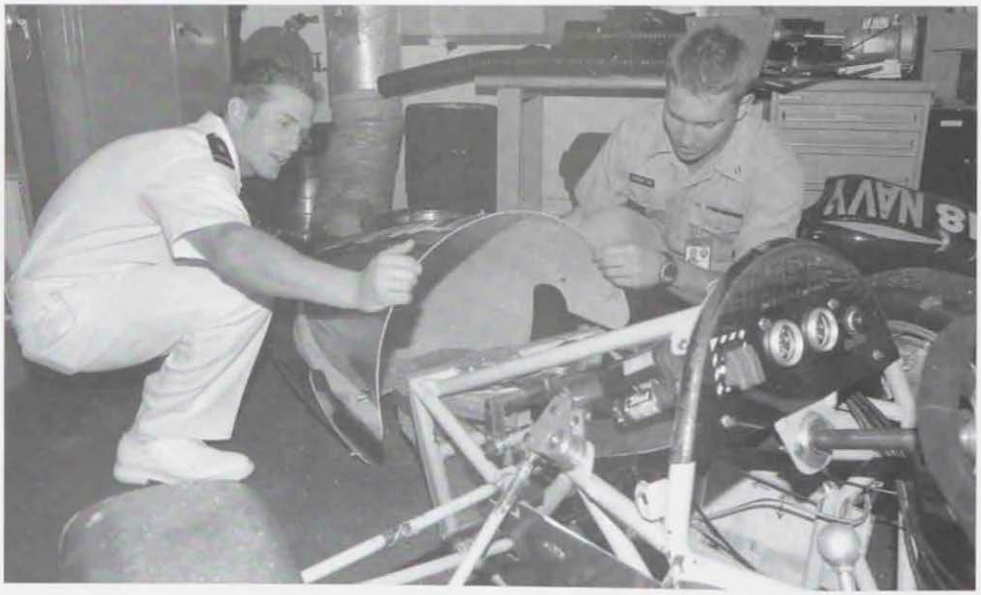
Hertz Fellowship (Fannie and John Hertz Foundation) for graduate study in the applied physical sciences at a choice of 27 universities.

National Science Foundation (NSF) Fellowship leading to a master of science or a master of arts degree in the mathematical, physical, biological, engineering, and social sciences and in the history and philosophy of science.

Draper Laboratory Fellowships for graduate study in technical majors at the Massachusetts Institute of Technology, Boston University or Northeastern University.

Immediate Graduate Education Program (IGEP) — 14 submarine officers in the Bowman Scholar Program each year, starting in June or July following graduation from the Naval Academy. Graduates selected for IGEP complete a one-year technical master's degree at the Naval Postgraduate School.

Midshipmen may apply for other scholarships at civilian universities in aerospace engineering, computer science, electrical engineering, mathematics, mechanical engineering, nuclear engineering, and physics.



Division of Engineering and Weapons

Aerospace Engineering Department
Electrical Engineering Department
Mechanical Engineering Department
Naval Architecture and Ocean Engineering Department
Weapons and Systems Engineering Department

Captain Robert L. Curbeam, Jr., USN (Ret.)
U.S. Naval Academy
Class of 1984

THE U.S. NAVAL ACADEMY
PRODUCES MORE ASTRONAUTS
THAN ANY OTHER UNIVERSITY
IN THE COUNTRY.

Aerospace Engineering Department

Aerospace Engineering Major

The aerospace engineering department offers one of the most exciting and challenging academic programs at the Naval Academy. The program is structured to produce naval officers who will serve in the forefront of the inception, development and employment of Navy air and space assets. The curriculum provides a background in engineering fundamentals through courses in chemistry, physics, mathematics, engineering mechanics, thermodynamics and electrical engineering. With these subjects as a base, students undertake aerospace engineering topics including aerodynamics, propulsion and aerospace structures. The major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

In the area of aeronautics, students extend their study of aerodynamics, flight structures and flight mechanics. The astronautics track allows students to study astrodynamics, satellite attitude dynamics and control, and the space environment. Both tracks conclude with a design course, which allows midshipmen to apply their engineering knowledge to the design of an aero or space flight vehicle. Both tracks also involve thorough laboratory experimentation. The Naval Academy's aerospace laboratory facilities are some of the most advanced and extensive in the country. These facilities include structures, propulsion and rotor labs; variable stability aircraft simulator; spacecraft tracking and experimentation facilities; and various wind tunnels with flow velocities ranging from subsonic to supersonic.

While graduates of all majors are prepared for careers in naval aviation, the aerospace engineering major is intended for those who are not only fascinated by flight but want to understand the technology of making air and space flight work.

Graduates from the aerospace engineering major are also fully prepared to undertake postgraduate education programs in engineering disciplines either at the Naval Postgraduate School or any other academic institution. Naval officers with advanced degrees in the aerospace areas may be assigned to billets involving the research, development, test and evaluation of Navy aircraft or spacecraft projects. Locations for these challenging technical billets include the Naval Air Systems Command, Naval Research Laboratory, Test Pilot School, the Navy's Space Command, the Unified Space Command, the Navy Space Support Activity and perhaps as a naval astronaut with the National Aeronautics and Space Administration.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS310, NS420;
Mathematics: SM212, SM221;
Science: SP211, SP212;
Humanities: HH215, HH216, two electives including one at the 300/400 level;
Engineering: EE331, EE334, EM211, EM232, EM321, EM319, ES300, ES410;
Major: **Aeronautics Track** - EA203, EA204, EA301, EA303, EA304, EA308, EA322, EA332, EA401, EA413, EA429, EA440, plus two major electives; **Astronautics Track** - EA203, EA204, EA305, EA308, EA322, EA362, EA364, EA365, EA461, EA465, EA467, EA470, plus two major electives.

Aerospace Engineering Courses

EA203 Principles of Aerospace Engineering I (2-2-3). First course of a two-course sequence covering the fundamentals of aerospace engineering. Topics in the course include the earth's atmosphere, the space environment, aerospace structures, atmospheric flight, propulsion and communications. Knowledge of spreadsheet, calculator, and computer programming fundamentals are developed. This sequence prepares beginning aerospace engineering students for further studies and develops sound engineering practices. *Prereq: SM122 or SM162.*

EA 204 Principles of Aerospace Engineering II (2-2-3). Second course of a two-course sequence covering the fundamentals of aerospace engineering. Topic in the sequence include the space environment, aerospace structures, space flight, attitude dynamics, propulsion, and communications. *Prereq: EA203.*

EA301 Aerodynamics I (3-0-3). Covers essentials of fluid mechanics and topics in aerodynamics including potential flow and thin airfoil theory. *Prereq: SM221and EA203.*

EA303 Wind Tunnel (1-2-2). A laboratory course in wind tunnel test techniques. *Coreq: EA301.*

EA304 Aerodynamics II (3-0-3). Discussion of 3-D finite wings, lifting surface theories, and vortex lattice methods. Introduction to viscous flow and boundary layer. *Prereq: EA301.*

EA305 Aero/Gas Dynamics (2-2-3). Covers essentials of fluid mechanics and kinematics with an introduction to potential flow. Basic one-dimensional compressible flow including thermodynamics of perfect gases in subsonic and supersonic flows. Introduction to nozzle flow. *Prereq: EA203&EA204; Coreq: EM319.*

EA308 Engineering Analysis (1-2-2). Applications of numerical theory and analysis to relevant engineering problems are the focus of this course. Topics include: solutions of systems of nonlinear equations, iteration techniques, nonlinear root-solvers, numerical integration and differentiation, and curve-fitting techniques. Applications are used to develop the tools necessary to solve realistic problems. *Coreq: SM212.*

EA322 Structures for Aerospace Engineers (3-2-4). A second course following EM321, in the analysis and synthesis of air and space vehicle structures. Topics include further study of axial loading, torsion, bending, and traverse loading; design for strength; internal force determination for plane and space structures using statics and matrix methods; displacement of structural systems using differential equation and strain energy methods; statically determinate and indeterminate structures using compatability and strain energy; wind bending and shear analysis; semi-monocoque open and closed structures; multi-cellular sections; and introductory composite structure analysis. Laboratory work and demonstrations are integrated to show the relevance of the topics and to give a practical insight to the behavior of aerospace structures. *Prereq: EM321.*

EA332 Gas Dynamics (2-2-3). Compressible flow of one-dimensional subsonic flows. Methods of gas dynamics in internal flow systems. Shock waves, waves in supersonic flow, linearized flows. *Prereq: EA301, EM319.*

EA362 Astrodynamics I (3-0-3). Introduction to the principles of planetary and satellite motion. Topics include the classical two-body problem, orbital parameters, orbit determination and maneuvers, remote sensing geometry, types of orbits and their uses, constellation design, orbit changes, perturbations and atmospheric drag effects, rendezvous, ballistic missile trajectories, and lunar and interplanetary travel. *Prereq: EM232 or (SM212 + SP212).*

EA364 Spacecraft Attitude Dynamics and Control (3-0-3). Rigid body dynamics and control of spacecraft. Euler angles, inertial properties of rigid and semi-rigid bodies, body-centered equations of motion, torque-free motion. Passive, active, and semi-active attitude controls. Gyroscopes and stable platforms. *Prereq: EA362.*

EA365 Rocket Propulsion (2-2-3). The principles of fluid mechanics and thermodynamics are applied to the problem of propulsion of aircraft and space vehicles. Cycle analysis, ramjets, jets and rockets. Air-breathing propulsion. Solid and liquid propellant rockets, fuels and applications. *Prereq: EA305 or equivalent.*

EA400 Introduction to Aeronautics (3-0-3). Introduces students to the applied science of air-breathing atmospheric flight. The course describes airplanes and how they fly from a design and application perspective. Included are topics in fluid dynamics, airfoil and wing theory, aircraft performance, stability, and aircraft design. *Prereq: Calculus II (SM122 or SM162).*

EA401 Aircraft Performance and Design (3-0-3). This course extends the basic principles for lift and drag calculations to performance analysis of the entire flight vehicle, and introduces the design selection process. The course is divided into four parts. The first part is a review of applied aerodynamics and propulsion and an intro to aircraft equations of motion. Static aircraft performance analysis is explored in the second portion of the course and accelerated/maneuvering aircraft performance is addressed in the third. Finally mission analysis, helicopter performance, and design constraints leading to design selection criteria are introduced. *Prereq: EA304.*

EA413 Stability and Control (3-0-3). The aerodynamic and inertial forces and moments acting on the flight vehicle and its component parts are analyzed to determine their effect on static and dynamic stability. *Prereq: EA301.*

EA414 Airplane Simulation and Control (3-0-3) Implementation of linear and non-linear airplane models for man-in-the-loop and batch simulation of airplane flight dynamics. Application of modern control methods to the design of airplane Stability Augmentation Systems and autopilots. *Prereq: EA413; Coreq: ES410 or equivalent.*

EA417 Elements of Flight Test Engineering (2-2-3). A lecture and laboratory course designed to provide practical applicaton of theoretical principles learned in courses in flight performance, aerodynamics, and stability and control. Topics include flight test theory and purpose, engineering test planning, flight test instrumentation, data analysis, and report writing. Activities include flight simulation, several flights in an aircraft, as well as interaction with naval flight test facilities for test data acquisition and analysis. *Prereq: EA401, EA413, and approval of dept. chair.*

EA424 Structural Dynamics (3-0-3). An introductory course in structural dynamics as applied to atmospheric flight and space flight vehicles. Topics include the analysis of free, damped and forced vibrations of systems with one or many degrees of freedom; vibrations of strings, beams and rectangular plates; matrix formulation of equations of motion; introduction to the finite element method of structural dynamic analysis. *Prereq: EA322.*

EA425 Viscous Flow (3-0-3). An advanced course covering viscous flow problems including laminar, turbulent, incompressible and compressible boundary layers with heat transfer. *Prereq: EA304.*

EA427 Aerodynamics III (3-0-3). An advanced course continuing the study of compressible high-speed flow including general conservation laws for inviscid flows, unsteady flow problems, numerical techniques for supersonic flows and real gas effects. *Prereq: EA304.*

EA428 Computational Aerodynamics (3-0-3). Introduction to the major numerical techniques used in computational aerodyna-mics. Topics include mathematical methods, boundary conditions, stability, panel methods, lattice methods, nonlinear problems, time dependent solutions and transonic flow problems. *Prereq: EA304.*

EA429 Flight Propulsion (2-2-3). The principles of fluid dynamics and thermodynamics are specialized to the problem of propulsion of aircraft. *Prereq: EA332.*

EA430 Propulsion II (3-0-3). The second propulsion course covers turbomachinery theory including compressors, turbines, pumps, application and design methods. Combustion and cooling techniques in modern engines are introduced. *Prereq: EA429 or EA365.*

EA435 The Aerodynamics of V/STOL Aircraft (3-0-3). An advanced course covering the aerodynamics of vertical and short takeoff and landing aircraft, including fixed wing and rotary wing types, with major emphasis on the helicopter. *Prereq: 1/C, aeronautical track major.*

EA439 Special Aircraft Design (1-4-3). This course, along with EA440, provides a two-semester sequence in aerospace design for selected midshipmen. *Prereq: 1/C standing in aerospace engineering.*

EA440 Aerospace Vehicle Design (1-4-3). Preliminary design of a flight vehicle. Includes preliminary layout, weight and balance estimates, performance analysis, stability analysis and structural analysis. *Prereq: 1/C, aeronautical track major.*

EA461 Space Environment (3-0-3). Introduction to the environment of the upper atmosphere, near Earth space, and interplanetary space. Topics include: properties of the upper atmosphere and ionosphere, the geomagnetic field, radiation belts and magnetosphere of the Earth, the solar wind and interplanetary medium, remote sensing of the atmosphere and oceans, environmental implications for spacecraft design. *Prereq: SP212.*

EA462 Astrodynamics II (3-0-3). Advanced topics in astrodynamics including potential of an arbitrary body and of the earth, orbit determination from observations including numerical techniques for data smoothing, special and general perturbations of orbits and interplanetary trajectories, drag effects on low altitude orbits. Special projects. *Prereq: EA362.*

EA463 Space Operations (3-0-3). This course investigates the relationship between mission operations and the other elements of a space mission. It defines a process for translating mission objectives and requirements into a viable mission operations concept. The course focuses on how we get information to and from space and then to the user in a usable format. *Prereq: EA362.*

EA465 Spacecraft Communications and Power (3-0-3). This course is intended to develop communications fundamentals with emphasis on digital communications, link budget analysis, and power subsystems. Secondary topics include: computer and data bus operations, command and data handling, telemetry, and tracking and control. *Prereq: EA362; Coreq: EE302 or EE332.*

EA467 Spacecraft System Laboratory (0-4-2). Laboratory analysis of the major system elements of space systems to include ground control and power, attitude control, communications, propulsion and thermal control. Constraints imposed by system application launch vehicles and environment are considered. Introduction to the engineering design process as well as its computer adaptations. *Prereq: EA364.*

EA469 Special Spacecraft Design (1-4-3). This course, in conjunction with EA470, provides a two-semester spacecraft design program for selected midshipmen. *Prereq: approval of department chair.*

EA470 Spacecraft Design (1-4-3). Preliminary design of a spacecraft. Includes: preliminary layout, weight and moment of inertia estimates, specifications of on-board systems, power subsystem requirements and design, and constraints imposed by launch vehicle and mission requirements. *Prereq: 1/C, astronautical track major or IT (Space Ops) major.*

Electrical and Computer Engineering Department

Electrical Engineering Major

Electrical Engineering is one of the cornerstone disciplines that will shape many aspects of the Navy for the foreseeable future. The major offers a solid grounding in the fundamentals of electrical engineering, as well as the opportunity to investigate advanced topics in communication systems, digital computers, fiber optic systems, microwaves, digital signal processing, and instrumentation. The Navy needs officers trained in these electrical engineering subspecialties to lead in the development, integration, and operation of advanced systems. The electrical engineering major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) and leads to a bachelor of science in electrical engineering.

Electrical engineering majors apply classroom concepts in the laboratory throughout the program. The Department has extensive well-equipped laboratories to provide excellent hands-on support for every course in the major. Dedicated laboratories support courses in analog and digital hardware, fiber optics, electronics, communications, electro-mechanical energy conversion, and advanced electrical engineering project design. The Department's strategy is to emphasize two things: a) individual learning at a lab station to ensure thorough understanding of required skills and b) the team approach to solving design problems. Labs are continually updated with leading-edge technology.

The electrical engineering capstone senior design laboratory sequence (EE411 and EE414) is the culmination of the electrical engineering major, integrating the many skills acquired in preparatory courses so that students can design, implement, test, and demonstrate a significant project. Two midshipmen per year are awarded the Steinmetz Prize for innovative work in the electrical and computer engineering design laboratory course sequences. The Captain Boyd R. Alexander Prize in electrical engineering is presented during Commissioning Week to the outstanding graduate in the major.

Graduates of the electrical engineering program are very well prepared for any of the many jobs they may be assigned in the fleet. The major also provides an excellent fundamental background and foundation for continued, more specialized study in electrical engineering at the graduate level on active duty after commissioning at the Naval Postgraduate School or any other academic institution.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM212, SM221, SM313;
Science: SP211, SP212;
Humanities: HH2XY, HH216, and two elective courses, including one at the 300/400 level;
Engineering: EM318, EM319, ES300, ES410;
Major: SI204, EE221, EE241, EE242, EE320, EE322, EE354, EE361, EE372, EE411, EE414, plus three major electives.

Computer Engineering Major

Computer engineering is a new discipline that has emerged from within the older discipline of electrical engineering. Smaller, faster, and cheaper are words that describe the revolutionary changes due to computer engineering. The computer engineering major closely follows the electrical engineering major for the first year, diverging thereafter. A solid grounding in the fundamentals of electrical and computer engineering is followed by the opportunity to investigate advanced topics in computer interfacing, computer networking, operating systems, fiber optic systems, and digital signal processing. The Navy will be able to use officers trained in computer engineering to lead in the development, integration, and operation of advanced computer-based systems. The Department plans to seek accreditation of the computer engineering major by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) at the earliest permissible time. The computer engineering major leads to a bachelor of science in computer engineering.

Computer engineering majors apply classroom concepts in the laboratory throughout the program, taking advantage of the Department's well-equipped laboratories to get hands-on experience in nearly every course in the major. The Department uses a two-pronged strategy to emphasize skills needed by computer engineering majors: a) encourage individual learning at a lab station to ensure thorough understanding of required skills and b) rely on team efforts in solving design problems. Labs are continually updated with leading-edge technology.

The computer engineering capstone senior design laboratory sequence (EE411 and EE415) is the culmination of the computer engineering major, integrating the many skills acquired in preparatory courses so that students can design, implement, test, and demonstrate a significant project. Two midshipmen per year are awarded the Steinmetz Prize for innovative work in the electrical and computer engineering design laboratory course sequences.

Graduates of the computer engineering program are very well prepared for any of the many jobs they may be assigned in the fleet. The major also provides an excellent fundamental background and foundation for continued, more specialized study in computer engineering at the graduate level on active duty after commissioning at Naval Postgraduate School or any other academic institution.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM212, SM221, SM313, SM342;
Science: SP211, SP212;
Humanities: HH2XY, HH216, and two elective courses, including one at the 300/400 level;
Engineering: EM318, EM319, ES300, ES360;
Major: SI204, SI221, EE221, EE241, EE242, EE320, EE322, EE354, EE361, EE362, EE411, EE415, plus two major electives.

Electrical Engineering and Computer Engineering Courses

EE221 Introduction to Electrical Engineering I (3-2-4). This course addresses the analysis of linear electric circuits through the application of basic network laws and theorems. The student derives solutions for DC circuits, sinusoidal steady-state circuits using phasor analysis, and first and second-order circuits using Laplace Transform techniques. The students are also introduced to some linear integrated circuits such as operational amplifiers and timers. Course material is reinforced by laboratory exercises where the students build circuits and take measurements with test equipment. The development of introductory troubleshooting skills and the maintenance of a lab notebook are emphasized. Computer simulation is used throughout the course to support both analysis and design objectives. *Prereq: Calculus I.*

EE241 Electronics I (3-2-4). The physics of semiconductor devices (p-n junction diode, bipolar and field effect transistors) is introduced. Device characterization in terms of appropriate external variables then leads to construction of small-signal and large-signal models. Emphasis is on practical electronic circuits such as amplifiers, filters, rectifiers, regulators and switching circuits. *Prereq: EE221 or EE331.*

EE242 Digital Systems (3-2-4). Fundamentals in realizing a digital system. Topics covered include Boolean algebra, Karnaugh mapping, flip-flops, state diagrams for system minimization and analysis of sequential and logic function circuits, binary arithmetic, decoders, encoders, multiplexers and demultiplexers, as well as counter and register design. An introduction to complex programmable logic device (field programmable gate array) systems is provided with applications to projects. *Prereq: EE221.*

EE301 Electrical Fundamentals and Applications (3-2-4). Provides an introduction to AC and DC circuit theory appropriate to model shipboard systems. Circuits of resistors, capacitors, inductors and sources are analyzed to predict steady state and first-order transient voltage, current, and power. Impedance matching, filters, transformers, motors/generators, and three-phase power distribution systems are introduced in the context of shipboard application. Laboratory exercises use tools and equipment found in the fleet and allow for a comparison of theoretical and actual circuit performance. *Prereq: Physics II (SP 212 or SP222).*

EE302 Electronic Communication Systems and Digital Communications (3-2-4). This course is a follow-on to EE301, Electrical Engineering Fundamentals. This course begins with the basic principles of digital logic circuitry followed by an introduction to computer architecture. The principles of Analog and Digital Communications are presented to include the most common digital modulation techniques and a study of Amplitude Modulation. Radio Wave propagation and the fundamentals of Antennas are also presented. The course ends with a study of the engineering fundamentals of networking including topology, connectivity, routing, bandwidth, subnetting, the OSI Model, TCP/IP, and the Internet as an application of networking concepts. *Prereq: EE301 or EE331.*

EE303 Digital Communications (2-2-3). This course begins with the theory behind radio waves and how they travel, as well as antenna fundamentals. Tuned circuits are also discussed along with their applications in communication circuits. The first major focus of the course is amplitude modulation as it applies to radio-frequency communications; frequency modulation is presented as a comparison. The second major focus is methods for converting between analog and digital data for communicating. Also covered are digital modulation, error detection and correction, and multiplexing techniques. During discussions of each topic, military application and relevance are covered. *Prereq: (EE3012 or EE331) and CSIT major.*

EE313 Logic Design and Microprocessors (3-2-4). This is an introductory level project course in digital electronics for non-EE majors. It begins with the design, analysis and minimization of both combinatorial and sequential circuits and their realization in both discrete components and programmable logic devices. The course progresses into the use of MSI devices and digital arithmetic. Finally, an introduction to assembly level programming and microprocessor/microcontroller-based systems design is also provided. *Prereq: EE302 or EE332 or approval of department chair.*

EE320 Introduction to Electrical Engineering II (2-2-3). This course provides an introduction to the analysis of power systems and rotating machinery. The student applies circuit analysis techniques to solve single-phase and three-phase power problems. Further, the analysis of ideal and non-ideal transformers, DC machines, and synchronous machines is included. An introduction to power electronic circuits is provided, including DC motor speed control and power supply examples. Problem solving and laboratory exercises are emphasized. *Prereq: EE221.*

EE322 Signals and Systems (3-2-4). The principles of circuit analysis are extended to the transmission of signals through linear systems. The approach is based on determination and interpretation of natural frequencies, pole-zero diagrams, and their relation to the governing system equations. Transform techniques are applied to the analysis of circuits. Both continuous-time and discrete-time systems are discussed. Computer software is used to model and analyze signals and systems. *Prereq: EE241 or approval of department chair.*

EE331 Electrical Engineering I (3-2-4). A study of DC and AC electrical elements and circuits, including Thevenin equivalence, natural and forced responses of first-order systems, AC power, and AC three-phase systems. Amplifiers, diodes and transistors are introduced and underlie discussion of applications in power regulation and machine control. AC and DC machines are investigated and discussed in the context of a shipboard environment. *Prereq: Physics II (SP212 or SP222).*

EE332 Electrical Engineering II (3-2-4). Modeling and analysis techniques are applied to rotating machines, diodes, op amps, transistors and amplifiers. Amplitude modulation and demodulation, as well as combinational and sequential digital logic are introduced. *Prereq: EE331.*

EE334 Electrical Engineering and IT Systems (3-2-4) This course is a follow-on to EE331, Electrical Engineering I. In this course, modeling and analysis techniques are applied to electronic communication systems including both analog and digital modulation/demodulation techniques. Also in the course, students design and analyse combinational and sequential digital logic circuits. An in-depth study of computer networking is included with specific emphasis on the OSI model and wireless systems. *Prereq: EE331.*

EE341 Electronics I (3-2-4). The physics of semiconductor devices (p-n junction diode, bipolar and field effect transistors) is introduced. Device characterization in terms of appropriate external variables then leads to construction of small-signal and large-signal models. Emphasis is on small-signal applications of these device models. Applications in basic amplifier and switching circuits are emphasized in laboratory exercises. *Prereq: EE221, EE311 or EE331.*

EE342 Electronics II (3-2-4). BJT and MOSFET amplifiers are studied. This includes the analysis of differential amplifiers, current mirrors, multistage amplifiers, feedback amplifiers, power amplifiers, and integrated circuit amplifiers. Feedback and frequency analysis of amplifiers are emphasized. Applications include active filters and oscillators. *Prereq: EE241 or approval of department chair.*

EE344 Solid-State Power Electronics (3-2-4). This course covers aspects of the analysis, simulation, design, control, and prototyping of power electronic circuits, with an emphasis on industrial and Department of Defense applications. Topical coverage includes rectifiers, dc-dc converters, dc-ac inverters, motor drives, semiconductor device characteristics, and practical issues such as snubbers, drivers, and heat dissipation. Design through mathematical modeling and simulation, followed by implementation and testing, is emphasized. *Prereq: EE241.*

EE354 Modern Communication Systems (3-2-4). Digital signal implementation and processing techniques are introduced. Various digital modulation methods as well as AM and FM methods are studied. Baseband and bandpass modulation and demodulation techniques are introduced. Probability theory is applied to determine the error performance of a binary phase-shift keying system. *Prereq: EE322 or approval of department chair.*

EE 361 Microcomputer-based Design (3-2-4). A principles-based foundation to the analysis and design of systems using microprocessors. The student will acquire a detailed understanding of the architecture and instruction set of a representative microcontroller, assembly-language programming of the microcontroller, and the use of interrupts. The student will design and build circuits with both digital and analog components and will learn to use timers, asynchronous serial communications, parallel communications, analog-to-digital and digital-to-analog converters, and pulse-width modulators. The derivation and use of design equations to achieve desired behavior is emphasized. *Prereq: EE242 or EE313 or EE332 or EE334.*

EE 362 Computer Architecture (3-2-4). This course covers organization, structure, and design of computers, starting with a review of the history of computers. Design topics include: complex and reduced instruction set design; data addressing; design of central processing units, registers, and arithmetic logic units; circuits to handle interrupts, resets, and other exceptions; horizontal and vertical microprogramming; data busses; memory system design; input/output system design; paging and segmentation; and cache design. A study of computer arithmetic covers two's complement addition and subtraction; Booth's and Robertson's algorithms for signed multiplication; restoring and non-restoring division; square root extraction; and floating-point hardware. *Prereq: EE242.*

EE 372 Engineering Electromagnetics (3-2-4). Basic transmission line theory is introduced with high-frequency circuit design applications. Maxwell's equations are formulated for time-varying fields and applied to waveguide, antenna, and radar systems. Labs provide practical experience with transmission lines, waveguides, optical waveguides, antennas, and radar. *Prereq: Physics II (SP212 or SP222).*

EE411 Electrical and Computer Engineering Design I (2-2-3). A series of design problems are presented to take the student through the total design process from specification to verification of performance. In addition to technical design, factors such as safety, economics, and ethical and societal implications are considered. A small project is executed and evaluated. Each student chooses a capstone project and develops and submits a proposed design to be completed in EE414 (for electrical engineers) or EE415 (for computer engineers). The proposal is presented to the student's peers and project advisors in lieu of a final exam. *Prereq: 1/C standing in EEE major or ECE major or approval of dept. chair.*

EE414 Electrical Engineering Design II (0-4-2). This course provides practice in engineering design, development, and prototype testing. Following approval of the project by the instructor, the student develops a prototype, troubleshoots it, gathers performance data on it, and completes construction and packaging of the final design. A formal briefing to peers and department faculty follows a written final project report on the completed project in lieu of a final exam. *Prereq: EE411 and 1/C EEE major or approval of department chair.*

EE415 Computer Engineering Design II (0-4-2). This course provides practice in computer engineering design, development, and prototype testing. Following approval of the project by the instructor, the student develops a prototype, troubleshoots it, gathers performance data on it, and completes construction and packaging of the final design. A formal briefing to peers and department faculty follows a written final project report on the completed project in lieu of a final exam. *Prereq: EE411 and 1/C ECE major or approval of department chair.*

EE420 Electric Machines and Drives (3-2-4). The course includes an introduction to magnetic circuits and electromechanical energy conversion principles. Building on these topics, the basic operation, analysis, modeling and design of transformers, dc machines, induction machines, and synchronous machines is then presented. The simulation and power electronic control of dc and ac machines are considered. The output waveforms of a synchronous machine/three-phase rectifier, as part of a dc distribution system, are investigated. The course utilizes both simulation exercises and extensive laboratory hardware exercises to reinforce theory and validate derived models. *Prereq: EE320.*

EE426 Fundamentals of Electronic Instrumentation (2-2-3). A practical introduction to the design of electronic instrumentation. Common to all instruments is input from the physical world. Many instruments also entail control of external devices. Students examine a wide range of sensors and actuators. Labs support a broad study of the major components of electronic instrumentation systems: sensors, data acquisition, signal conditioning, computer control, and actuators. *Prereq: EE302 or EE332.*

EE431 Advanced Communication Theory (3-2-4). Digital and analog communication systems and concepts. Fourier analysis, sampling theorem, autocorrelation function, power spectrum, cross-correlation function, cross-spectrum, pseudonoise sequences, matched-filters, spread-spectrum, coding, PCM, TDM, and FDM are defined and applied. Probability, random variables, and random-signal principles are used to compute the information content of a message and to compute the error rates in digital communication systems. *Prereq: EE354 or EE332 or approval of department chair.*

EE432 Digital Signal Processing (3-2-4). Digital signal processing principles are studied and applied to modern radar, sonar and communications systems. The DFT is introduced, its properties are explored, and the FFT algorithm is developed. Discrete correlation, convolution, spectral analysis, matched filter detection problems, complex demodulation techniques, the Z transform, and stability of discrete systems are explored. Properties of FIR and IIR digital filters are studied. Digital filters are designed and applied to random and deterministic signals. *Prereq: EE322 or EE332 or approval of department chair.*

EE433 Wireless and Cellular Communications Systems I (3-2-4). An in-depth study of wireless and cellular systems. This study includes system design, mobile radio propagation (large-scale path loss, small-scale fading, and multipath), and modulation techniques for mobile radio. A working knowledge of the characteristics of the three major cellular/PCS systems in use in the U.S. today is also developed. Technical discussions of recent topics/publications related to the course material are also conducted. Laboratory experiments emphasize indoor and outdoor RF propagation measurements. A final project is required in lieu of a final examination. *Prereq: EE354 or approval of department chair.*

EE434 Wireless and Cellular Communication Systems II (3-2-4). A continuation of the in-depth study of wireless and cellular systems. This study includes modulation techniques for mobile radio, equalization, diversity, and chan-

nel coding. Small group research projects are conducted in lieu of a final exam. *Prereq: EE433 or approval of department chair.*

EE435 Biometric Signal Processing (3-2-4). Digital signal processing methods for multi-dimensional signals are studied and applied to biometric signals (primarily face, fingerprint and iris images or video) for use in determining an individual's identity. Digital image processing in the spatial and frequency domains, in conjunction with pattern recognition techniques, are developed and tested. The students have the opportunity to work hands-on with state-of-the art commercial systems that perform biometric recognition, and become familiar with issues that surround the collection and use of biometric data (such as privacy). *Prereq: EE432 or approval of department chair.*

EE451 Electronic Properties of Semiconductors (3-0-3). This course develops an understanding of semiconductor properties and how they determine the performance of semiconductor devices. Hole and electron conduction and charge carrier distribution models are developed. Charge carrier generation and recombination and carrier dynamics leading to drift and diffusion are used to study semiconductor transport phenomena. The p-n junction, the bipolar junction transistor, and the field-effect transistor are studied in detail. *Prereq: Physics II (SP212 or SP222) or EE241 or approval of department chair.*

EE452 Semiconductor Electronics (3-2-4). This course continues on the foundations developed in EE451 for discrete semiconductor devices. This course will focus on basic analog and digital transistor circuits, and how transistor design affects their performance. Computer-aided transistor circuit design and simulation are emphasized. Solar cells, light-emitting diodes, microfabrication techniques, and microelectro-mechanical systems (MEMS) are also introduced. The laboratory involves an individual student research project. *Prereq: EE451 or approval of department chair.*

EE462 Microcomputer Interfacing (2-4-4). This course provides a strong foundation in techniques for connecting computers to peripheral and communications devices and in the methodology for programming the computer to control external devices in real time. This course is supported by a project-oriented laboratory with an opportunity to use a wide variety of computer-controlled peripheral devices. The student will learn the architecture of a representative microprocessor and how to use the C programming language to program it. A major emphasis of the course is the in-depth study of interrupt processing, polling, direct memory access, parallel input/output (I/O) protocols, inter-process communication, and modular techniques for designing hardware and software. *Prereq: EE242, EE313, or EE332.*

EE464 Introduction to Computer Networks (3-2-4). This course provides a foundation in the fundamentals of data and computer communications. Emphasis is placed on protocol and network design. Critical technical areas in data communications, wide-area networking, and local area networking are explored. *Prereq: EE354 or approval of department chair.*

EE471 RF Power Electronics (3-2-4). This course leverages the student's previous study in electronics and eletromagnetics to examine RF power concepts and devices. Some of the topics include: electron dynamics, electron beam-wave interaction, vacuum RF power devices and high frequency semi-conductor devices. The course draws upon current research at the Naval Research Laboratory and invited speakers to present timely and practical applications in U.S. Navy weapons systems and sensors. The various threads of course material come together in the study of the microwave power module (MPM) and the millimeter wave power module (MMPM), an integration of vacuum and semiconductor electronics to produce light-weight, high power, high frequency devices used to power the current unmanned aerial vehicle (UAV) sensors. Laboratory work includes power and frequency measurements on a variety of devices, as well as the use of simulation software to model the performance of RF power devices. *Prereq: EE372.*

EE472 Fiber Optical Communications (3-2-4). An introduction to the nature of optical waveguides and fiber optical communications systems. Fiber propagation modes, dispersion and attenuation are studied. Lightwave transmitters and receivers, optical amplifiers, and components for wavelength division multiplexing are discussed, and a complete optical communication network is analyzed. *Prereq: EE354 or approval of department chair.*

Mechanical Engineering Department

Mechanical Engineering Major

The mechanical engineering major, accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, offers one of the most diversified engineering programs available at the Naval Academy. In addition to an education in mechanical engineering, the program prepares its graduates to assume responsibilities in any of the warfare specialties of the U.S. Navy and U.S. Marine Corps. Graduates will be in positions of responsibility involving the operation and maintenance of high technology weapons systems. As officers progress through their careers, many will assume positions of responsibility as managers of weapons systems development and procurement. This dictates a program that emphasizes a broad spectrum of undergraduate studies. The program thus includes required courses in solid and fluid mechanics, dynamics, thermodynamics and energy systems, materials engineering and a significant emphasis on electrical engineering and control systems fundamentals. This broad background in the fundamentals of mechanical engineering prepares midshipmen to select elective courses in any of the five tracks within the mechanical engineering program. These tracks are energy systems, engineering mechanics, marine propulsion, materials engineering and nuclear engineering. A midshipmen can choose to specialize in a particular area by selecting all of their electives in one track, or a more general approach can be taken by selecting electives across several tracks.

The program takes seriously the need to develop graduates who have a sound understanding of the design process and its importance in the success of engineering activity. Design education in the program is focused through a sequence of five courses, beginning in the first semester of the sophomore year (EM215, EM371, EM375, EM471, EM472), which make up the design backbone. Each semester, other courses that are more often identified with engineering science support the backbone through problems and small projects that build on concepts and tools developed in the design backbone. This approach weaves the subjects of design and design tools into the program as an integrated engineering activity. A Navy or Marine Corps officer with a bachelor's degree in mechanical engineering is well prepared for a wide variety of career assignments both ashore and afloat. Operational sea billets in surface ships, submarines, and aircraft squadrons provide many opportunities for a mechanical engineer to develop practical experience in a warfare or engineering specialty area while contributing to fleet engineering and material readiness. The operational environment enables a junior officer to rapidly develop sound leadership and managerial abilities while refining mechanical engineering capabilities acquired at the Naval Academy. Ashore, the mechanical engineer has a wide range of opportunities in sub-specialty billets with naval applications. These include such areas as ship and aircraft design, propulsion systems, environmental systems, advanced engineering education, major project management and weapons systems acquisition. There is an abundant and continuing need for mechanical engineers throughout today's naval service.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM212, SM221;
Science: SP211 and SP212;
Humanities: HH215, HH216, and two electives including one at the 300/400 level;
Engineering: EE331, EE334, EM211, EM217, EM232, EM319, EM324, ES300, ES410;
Major: EM215, EM313, EM320, EM371, EM375, EM415, EM471, EM472, plus three major electives.

General Engineering Major

The general engineering major provides a basic technical education in mathematics, science, engineering and naval professional subjects. It offers a broad engineering background for future naval service and for additional advanced technical training and education. Midshipmen completing the general engineering major receive a designated bachelor of science degree.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NN200, NE203, NS 300, NL310, NL400, NS42X;
Mathematics: SM221, SM212;
Science: SP211, SP212;
Humanities: HH2XY, HH216 plus two electives including one at the 300/400 level;
Engineering: EE301, EE302, ES300, ES360, EE313;
Major: EM211, EM232, EM319, EM 318, EN200, SM230, plus eight major electives and one free elective

Mechanical Engineering Courses

EM211 Statics (3-0-3). An initial course in applied vector mechanics with emphasis on static equilibrium. Topics include forces, moments, couples, equivalent force-couple systems, centroids, distributed forces, and Coulomb friction. The application of the free body diagram in the analysis of static equilibrium of frames, machines and trusses is stressed. *Prereq: none; Coreq: Calculus III and Physics I.*

EM215 Introduction to Mechanical Engineering (2-2-3). This is an overview course that introduces the student to the main areas of mechanical engineering, mechanics, materials, and thermoscience. In addition, it provides background in visualization skills and the design process. Projects are used to enhance the understanding of mechanical engineering and the design process. *Prereq: none; for ME majors only.*

EM217 Strength of Materials (3-2-4). A first course in mechanics of deformable bodies with emphasis on the engineering approach to the responses of these bodies to various types of loadings. Topics include stress-strain relationships, stress-strain analysis, stress and strain transformation (Mohr's circle), load-deflection, bending, torsion, buckling, and temperature effects. *Prereq: EM211; Coreq: SM212.*

EM232 Dynamics (3-0-3). Course in classical vector dynamics. Topics include vector algebra and calculus, kinematics and kinetics of particles and rigid bodies, as well as energy and momentum methods. Extensive problem solving involving particle and rigid body motion is required. *Prereq: EM211; Coreq: SM212.*

EM300 Principles of Propulsion (3-2-4). A study of naval engineering systems, including the principles of energy conversion and the basic operation of steam, gas turbine and internal combustion engine power plants. *Prereq: Physics I (SP211 or SP221).*

EM300N Principles of Propulsion/Nuclear (3-2-4) Study of engineering systems principles of energy conversion via steam, gas turbine and internal combustion. Covers nuclear power propulsion principles. *Prereq: Physics I (SP211 or SP221), 3/C cruise.*

EM313 Materials Science (3-2-4). An introductory course in the physical and mechanical properties of engineering design materials including metals, ceramics and plastics, their structures, use in engineering applications and failure phenomena. All laboratory projects are structured to provide strong physical illustrations for the topics covered in lectures. *Prereq: none.*

EM318 Applied Fluid Mechanics (3-0-3). A first course in incompressible fluid mechanics. Topics include properties of fluids, fluid statics, integral conservation equations, differential field analysis, dimensional analysis and similitude, incompressible boundary layers, viscous flow in conduits and flow about immersed bodies. *Prereq: SM212.*

EM319 Engineering Thermodynamics (3-0-3). A basic thermodynamics course in which the first and second laws of thermodynamics are studied primarily from the classical macroscopic viewpoint and applied to both closed and open systems. Working substances include perfect gases, real gases and vapors in addition to solids and liquids. Naval applications are emphasized. *Prereq: none; Coreq: SM212.*

EM320 Applied Thermodynamics (2-2-3). Laboratory equipment which operates on principles of thermodynamics and fluid mechanics is used to reinforce analyses and design of gas and vapor power cycles, refrigeration and air conditioning, ship and aircraft propulsion systems, combustion, energy conversion and compressible flow. *Prereq: EM319 or equivalent.*

EM321 Mechanical and Materials for Aerospace Engineers (3-2-4). A first course in materials and mechanics. Topics include: aerospace materials properties; treatments; manufacturing and fabrication processes including jointing; design and selection considerations, including durability, reparability, maintainability, corrosion and protective treatments; fatigue and creep phenomena; basic elasticity; simple structural element behavior for rods, beams, shafts and plates. Laboratory work and demonstrations are integrated to show the relevance of topics and to give practical insight to the behavior of aerospace structural materials and structures. *Prereq: EM211.*

EM324 Fluid Dynamics (3-2-4). An introductory course in fluid dynamics stressing both the integral and differential forms of the conservation laws of fluid flow. Engineering applications are made to hydrostatics and to ideal and real fluid flows. Laboratory experiments and problems sessions complement the lectures. *Prereq: none; Coreq: EM319 or equivalent.*

EM362 Reactor Physics I (3-0-3). An introductory course in radiation physics and nuclear reactors. Course covers topics in atomic models, different types of radiation and their interaction with matter, radioactivity, fission process, neutron diffusion, and reactor criticality concepts for bare and reflected homogeneous systems. *Prereq: SM212 or SP222.*

EM371 Introduction to Design (2-2-3). Fundamentals of mechanical design, with emphasis on the design of pertinent machine elements. Topics such as fasteners, springs, anti-friction bearings, lubrication and journal bearings, gearing and shafts are covered. Also included are static and fatigue failure theories. *Prereq: EM217, EM232.*

EM375 Mechanical Engineering Experimentation (2-2-3). A design course that emphasizes the theory and practical considerations associated with contemporary experimental procedures, methods and design strategies. Topics include measurement error and its propagation, equation fitting and plotting, signal acquisition and validation, instrument response and elements of experimental design. Emphasis includes computer aided data reduction, modeling of a system and report writing. *Prereq: SM212, EM217 and EM232.*

EM380 Engineering Review (0-2-0). A comprehensive review course to prepare students to take the Engineer-In-Training (EIT) or Fundamentals of Engineering (FE) examination. Topics include mathematics, chemistry, computers, electrical engineering, engineering economics, statics, dynamics, thermodynamics, fluid mechanics, and mechanics of materials. *Prereq: 1/C engineering major.*

EM415 Heat Transfer (3-2-4). Study of thermal radiation, steady and transient conduction, laminar and turbulent convection, internal and external flow, boundary layers and empirical correlations. Applications address fins, nuclear reactor cooling, heat exchangers and interactive computing. *Prereq: EM319 and EM324.*

EM423 Mechanical Vibrations (2-2-3). The treatment of vibration fundamentals including free, damped and forced harmonic vibrations of linear single and multi-degree of freedom systems, modal analysis, continuous systems and a practical project. *Prereq: EM217 and EM232.*

EM433 Computer-Aided Manufacturing (2-2-3). This course examines how computers and automation are used in modern manufacturing processes. Topics include machining processes, CNC programming, process planning, dimensioning, and tolerancing. Students participate in a manufacturing project, which utilizes CAD/CAM software to design and manufacture a component using CNC machining equipment. *Prereq: 1/C engineering major.*

EM436 Mechanics of Composite Structures (2-2-3). An introductory course that emphasizes the mechanics of structures containing composite materials. Topics covered include the generalized Hooke's Law, lamina constitutive relationships, mechanics of fiber reinforced lamina, lamina strength analysis, and the mechanics of composite

laminates. Analysis is accomplished through computer lab assignments. *Prereq: EM217.*

EM443 Energy Conversion (3-0-3). Introduction to energy conversion and utilization. Terrestrial and thermodynamic limitations, direct energy conversion devices, alternative energy sources, present and future energy research design and development and energy usage and economy are presented. *Prereq: EM319 or equivalent.*

EM445 Nondestructive Evaluation (2-2-3). The course examines each of the quantitative sensor-based methods for non-invasively assessing the structural integrity of materials–metals and composites. The methods covereed include sonic, ultrasonic, electro-magnetic, optical and infrared. The important properties of any sensor are its wavelength, beam spread, and resolution and each student will receive a solid understanding of how these three key parameters are used to provide optimal NDE results for understanding material properties as well as detecting internal defects. Labs involve materials imaging, subsurface characterization and imaging, microstructure and properties characterization, and defect characterization in naval and aerospace components. *Prereq: SP212, EM313.*

EM446 Heating, Ventilation and Air Conditioning: Design (3-0-3). Principles of thermodynamics, heat transfer, and fluid mechanics as applied to the design and control of thermal environments. Cycles and equipment for heating, cooling and humidity control. Air transmission, distribution and cleaning are also considered. *Prereq: EM319 and EM320 or equivalent.*

EM450 Compressible Flow and Turbomachinery (3-0-3). Fundamental principles of fluid dynamics and thermodynamics are applied to one-dimensional compressible flows. Topics include varying-area isentropic flow, flow with friction, flow with heat transfer and normal and oblique shock waves. Introductory concepts in the design and analysis of turbomachinery are covered. *Prereq: EM320, EM324 or equivalent.*

EM451 Design of Robotic Elements (2-2-3). This course addresses practical issues concerning the design, fabrication and operation of wheel-driven mobile robots. The objectives of the course are to: (1) design and fabricte wheel-driven mobile robots to accomplish particular performance objectives, (2) select typical elements used in robot construction such as electric motors, drive train components, pneumatic omponents, and sensors, and (3) develop and test code for a programmable robot controller to incorporate various sensors and enable autonomous operation. The course utilizes a hand-on, project-based approach to learning about robotics. Upon completeion of this course, the student should have a better understanding of how typical robots work, how various mechanisms can be designed to achieve prescribed motions, and how microprocessors are used to control robots. *Prereq: EM371.*

EM453 Materials: Processing and Fabrication (2-2-3). State-of-the-art and advanced process and fabrication techniques are examined for metallic, polymeric and composite materials. Aspects of the production of the basic components of material systems are examined. Also, post processing and fabrication thermal treatments to improve the material system will be discussed. The course is directed to proper process and fabrication selection for efficient and safe design of mechanical systems. *Prereq: EM313 or EM214.*

EM454 Mechanical Behavior of Materials (3-0-3). Treatment of mechanical behavior from a materials viewpoint. In addition to metallic materials, engineered materials, such as metallic, polymeric and ceramic composites are included. Elastic and elastic-plastic behavior are treated, as well as modes of fracture, including brittle and ductile. Scanning electron microscopy is performed for fractography. Ductile-to-brittle transition, elastic fracture mechanics, fatigue and creep are considered. *Prereq: (EM214 or EM313) and EM217.*

EM456 Corrosion and Corrosion Control (2-2-3). A course dedicated to the study of various types of corrosion including the electrochemical and metallurgical mechanisms responsible for each and their prevention. The course concentrates principally on the structural alloys used in the marine environment. Laboratory sessions involve demonstrations and hands-on experiments, which complement the lecture material. *Prereq: EM313.*

EM458 Failure Analysis (2-2-3). A course designed to introduce the student to the principles, tools and techniques used in the analysis of materials failures. Laboratory skills in non-destructive testing, optical and electron microscopy, mechanical testing, corrosion and wear testing are developed. Emphasis is placed on actual case histories and the student is required to complete analysis of a failed component. *Prereq: EM217, EM313.*

EM461 Engines: Principles, Design and Applications (2-2-3). The course objective is to provide a fundamental understanding of reciprocating internal-combustion engine design and operation. This is achieved by linking existing engine hardware design and performance analysis to concepts and disciplines studied in the mechanical engineering curriculum. *Prereq: EM320 or approval of department chair.*

EM463 Reactor Physics II (2-2-3). The topics covered include neutron generation times, reactor period, delayed neutrons, negative temperature coefficient, xenon poisoning, control rod theory, shielding and a reactor kinetics case problem. *Prereq: EM362.*

EM468 Nuclear Energy Conversion (3-0-3). Principles of the conversion of nuclear energy into useful power are covered. Various types of nuclear power plants, their design, cycles, load following characteristics, etc., are studied. Advanced nuclear energy conversion systems, including fusion, are also studied. *Prereq: EM362.*

EM471 Mechanical Design I (2-2-3). The first course in a two-semester capstone design sequence. Topics include the engineering design process, project managment, codes and standards, engineering ethics, and computer-aided design. Students form design teams, select a capstone design project and progress through the proposal and preliminary design stages of the project. The capstone design project continues in EM472. *Prereq: EM371.*

EM472 Mechanical Design II (2-2-3). Part two of the two-semester capstone design course sequence. Students continue with concept selection, detail design, prototyping and evaluation of their capstone design projects. Formal presentations and reports are prepared to review and document the designs. *Prereq: (EM371 and EM471) or approval of department chair.*

EM474 Gas Turbines: Design and Analysis (2-2-3). A course designed to acquaint the student with the design and analysis of modern gas turbine engines currently employed by the U.S. Navy. The emphasis is on the constraints and limitations of the various components that comprise shaft power gas turbine engines such as axial and centrifugal compressors, combustors, axial and radial turbines, intercoolers, reheaters, regenerators and inlet/exit diffusers and nozzles. In addition, component matching and the problems associated with it will be studied. Also, future concepts in turbo machinery propulsion will be discussed. The course assumes a basic knowledge of thermodynamics and will add to the student's knowledge in such areas as compressible flow in turbo machinery, combustion analysis and emissions control. The culmination of the course is a final design project. *Prereq: EM320.*

EM476 Undersea Power Systems (3-0-3). The principles of design of undersea power systems are presented. Topics include batteries, fuel cells, thermoelectrics, magnetohydrodynamics, thermophotovoltaics, and OTEC. *Prereq: EE332 and (EM318 or EM324 or approval of department chair).*

Naval Architecture and Ocean Engineering Department

Naval Architecture Major

One of the oldest engineering disciplines, naval architecture focuses on unique and complex end-products, vessels to travel the world's vast oceans, lakes and rivers. A special combination of knowledge and experience is needed to design and build these vessels. Variety exists not only in the work involved (research, design, fabrication, and management), but also in the types of craft — from sailboats to aircraft carriers, hydrofoils to catamarans, submarines to surface-effect ships and tugs to supertankers.

Naval architects use both art and science in designing ships. Armed with imagination and experience, they convert functional requirements into a suitable, cost-effective design. They analyze and select the best dimensions, materials and hull form, calculate the power requirements and estimate the weights of the principal components. They design and analyze the hull structure and decide on the location of machinery spaces, living quarters, storage spaces, tankage and weapons systems. In addition, naval architects design in safety features such as watertight compartments so that, if damaged, the chances of the vessel sinking or capsizing are minimized.

Naval architecture at the Naval Academy approaches these topics in a fully integrated program of classroom sessions, hands-on laboratory work, field trips, projects and the latest in computer-aided ship design techniques. A naval architecture design room, two towing tanks, a circulating water channel, structural testing equipment and a static stability tank are some of the many facilities available to midshipmen majoring in naval architecture. Distinguished and innovative faculty complement these excellent facilities and contribute to making naval architecture an outstanding undergraduate engineering major. The major is fully accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. A bachelor of science in naval architecture is awarded.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM212, SM221;
Science: SP211, SP212;
Humanities: HH2XY, HH216 plus two electives including one at the 300/400 level;
Engineering: EE331, EE334, EM318, EM319, ES300, ES360;
Major: EN221, EN222, EN247, EN330, EN342, EN353, EN358, EN380, EN455, EN471, EN476, plus two major electives and one M/S/E elective.

Ocean Engineering Major

Ocean Engineering holds the key to the last frontier on earth, the ocean depths. While marine scientists provide us with a basic knowledge of the ocean environment, the ocean engineer enables us to use this environment more effectively. By blending the fundamentals of mathematics, physics, chemistry and oceanography with knowledge of the engineering sciences, including ocean materials and wave mechanics, the ocean engineer plans, designs and builds a variety of coastal, harbor, and offshore structures; unmanned underwater vehicles and diver-support equipment; underwater acoustic systems; ocean energy and other marine-related environmental systems. Multi-disciplinary in nature, ocean engineering will appeal to civil, electrical, environmental and mechanical engineers who wish to practice in the ocean realm.

The ocean engineering major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The major offers an integrated program of study, using a balance between classroom theory, laboratory work and practical application providing midshipmen with the background to work effectively as ocean engineers. Laboratory experiments are conducted in the 120-foot and 380-foot wave and towing tanks and coastal engineering basin. These are equipped with electro-hydraulic wave-makers and instrumented with sophisticated sensors and on-line data acquisition and analysis equipment. A circulating water channel, hyperbaric test facility and an environmental chamber are also available. The Naval Academy's computer systems are used in solving design problems and preparing computer-aided designs. Supervising, directing and teaching this program is a team of professionals recognized for providing one of the finest undergraduate majors in ocean engineering available in the country. A bachelor of science in ocean engineering is awarded.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM212, SM221;
Science: SP211, SP212;
Humanities: HH2XY, HH216, and two electives including one at the 300/400 level;
Engineering: EE331, EE334, EM211, EM217, EM232, EM319, EM324, ES300, ES360;
Major: EN245, EN330, EN380, EN441, EN461, EN462, EN475, SO221, plus four major electives.

Naval Architecture and Ocean Engineering Courses

EN221 Engineering Mechanics with Marine Applications I (3-2-4). First course in a two-semester sequence covering the principles of engineering mechanics of rigid and deformable bodies for naval architecture students. Topics in the first course include forces, moments, static equilibrium, stress, strain, stress-strain relations and transformations, torsions in shafts, flexure in beams, column buckling, and temperature effects. *Prereq: 3/C ENA major.*

EN222 Engineering Mechanics with Marine Applications II (3-2-4). This second course in a two-semester sequence covering the principles of engineering mechanics of rigid and deformable bodies for naval architecture students. Topics in the second course include: generalized Hooke's Law and states of stress, structural failure theories, motion of a point, energy methods, impact loadings, momentum methods, planar kinematics of rigid bodies, energy and momentum in rigid body dynamics and single DOF vibration analysis. *Prereq: EN221.*

EN245 Principles of Ocean Systems Engineering (2-2-3). This course introduces new ocean engineering majors to the general problems and dsign practices in the areas of the ocean environment, coastal engineering, offshore structures, ocean materials, ocean acoustics, and underwater systems. Basic naval architecture principles are also covered, including hydrostatics, stability and buoyancy, and powering. The use of laboratory experiments and computer-aided drafting (CAD) are ephasized. *Prereq: EOE major or approval of department chair.*

EN247 Principles of Naval Architecture (0-4-2). This course, which is intended for midshipmen majoring in naval architecture, provides an overview of topics paramount to ship design. Topics include introductions to engineering design, engineering graphics, numerical methods, buoyancy, ship structures, and marine propulsion systems. A design project is used to provide students with a hands-on experience in designing a simple vessel. *Prereq: ENA major or approval of department chair.*

EN330 Probabilities and Statistics with Ocean Applications (3-0-3). Covers the basic concepts of probability and statistics with the aim of providing an understanding of the probabilistic nature of the forces acting on a marine structure. A statistical representation of the sea surface is developed in order to determine design values for structural loading and vehicle motion. *Prereq: SM212 and (EN245 or EN247).*

EN342 Ship Hydrostatics and Stability (3-2-4). Theories and procedures for predicting a ship's hydrostatic response to various conditions are addressed. Methods for computing the stability characteristics of both intact and damaged ships are studied. Floodable length computations are taught. Stability and subdivision criteria are explained. The lines plan for a hull form is developed and analyzed. *Prereq: EN245 or EN247.*

EN353 Resistance and Propulsion (3-2-4). Topics include dimensional analysis, similitude, wave and viscous resistance of ships, ship-model testing techniques, full-scale performance prediction, momentum theory of propulsive devices and propeller vibrations and design. The course also covers the experimental aspects of marine vehicle resistance and propulsion. *Prereq: (EN245 or EN247) and (EM318 or EM324).*

EN358 Ship Structures (3-2-4). A course in structural theory and practice. Topics include longitudinal and transverse strength of the hull girder, bending moments in a seaway, plate theory, development of ship structural design, finite element analysis, and applications of shipbuilding materials. *Prereq: EM217 or EN222; Coreq: EN353.*

EN380 Naval Materials Science and Engineering (3-0-3). The course addresses the optimal use of materials in ocean systems with emphasis on corrosion prevention, fracture mechanics and basic materials science. *Prereq: Chemistry II (SC112 or SC151); Coreq: EM217 or EN222.*

EN400 Principles of Ship Performance (3-2-4). This course is an introduction to the applied science of ship systems. The course describes ships and sumarines and how they remain afloat from a design and application perspective. Included are topics in hydrostatics, ship stability and operability, materials, fluid dynamics and propulsion. EN400 is an appropriate substitute for all majors where EN200 is required. *Prereq: 2/C standing or permission of department chair.*

EN401 Engineering in the Littoral Zone (3-2-4). This course is an introduction to engineering principles applied to the near-shore and on-shore environment. Basic engineering mechanics, strenth of materials and soil mechanics are studied to provide a base for further investigation. Coastal processes including wave action, sediment transport, beach formaiton and erosion are discussed. How the combination of such processes and basic mechanics affect such things as small boat hydrostatics, sea-to-shore logistics operations, and coastal structure assessment and construction are studied. 1/C midshipmen having selected (or intending to select) Marine Corps service may substitute EN401 for EN200. *Prereq: 1/C standing or permission of department chair.*

EN411 Ocean Environmental Engineering I (2-2-3). An introduction to basic principles and current issues in environmental engineering as applied to the ocean environment. Topical coverage includes chemical and biological considerations in water quality, diffusion and dispersion in estuaries and oceanic environments, engineering methods used to analyze and mitigate the effects of marine pollution, and environmental ethics and regulatory statutes. *Prereq: 1/C engineering major or approval of department chair.*

EN412 Ocean Environmental Engineering II (3-0-3). Basic principles and current issues in environmental engineering as applied to the ocean environment are introduced. Principal focus is on ocean resources: their identification, recovery and utilization. Topical coverage includes the technological aspects of alternate energy sources; deep-ocean oil and gas recovery; desalinization; dredging and uses for dredge spoil; mineral exploitation; ocean depositories; wetlands, reefs and other coastal developments; and environmental economics, ethics, and regulatory statutes. *Prereq: 1/C engineering major or approval of department chair.*

EN420 Coastal Engineering (2-2-3). This course provides an overview of the methods used to design both shore protection systems and port and harbor structures. Topics include sea level fluctuations, wind-wave forecasting, shallow water wave transformation, sediment transport, littoral processes, "soft engineering" approaches like beach nourishment, and structural design of revetments, groins, jetties, and breakwaters. Emphasis is on the design process using Army Corps of Engineers design manuals. *Prereq: EN475, 1/C EOE major or approval of department chair.*

EN425 Ocean Thermal Systems (3-0-3). Applies the concepts of thermodynamics, fluid dynamics, psychrometrics and heat transfer to ocean systems and ocean environmental systems. Includes thermal energy conversion to power cycles, including internal and external combustion engines and gas turbines. Topics include: refrigeration, air conditioning, heat pumps, incompressible and compressible flow, mass and energy balances and heat exchanger designs. *Prereq: EM319; Coreq: EM324.*

EN430 Underwater Work Systems (2-2-3). This course acquaints the student with design and operational considerations for working in the subsea environment. Topic coverage includes manned submersibles, unmanned remotely-operated vehicles, autonomous underwater vehicles, and deep-dive systems. *Prereq: 1/C engineering major or approval of department chair.*

EN440 Design of Foundations for Ocean Structures (3-0-3). This course covers basic soil mechanics principles and then applies these to the design of foundation systems, with an emphasis on the unique nature of coastal and ocean conditions. Topics include recommended practices and procedures for planning, designing and constructing adequate foundations for marine structures, including shallow foundations, deep pile foundation, vertical retaining walls, and anchoring systems. *Prereq: (EM217 or EN222) and 1/C EOE major or approval of department chair.*

EN441 Ocean Engineering Structures I (3-0-3). Structural design considerations for fixed ocean structures, such as docks, piers, and steel-jacket structures, are analyzed. Design techniques including matrix methods and finite element analysis are introduced. Boundary conditions, wave effects, foundations, loading and materials considerations are studied. *Prereq: EM217 or EN222.*

EN442 Ocean Engineering Structures II (2-2-3). In this course in structural design theory and practice, basic structural elements of offshore and coastal structures are designed using current engineering design codes. Topics include material properties, connection methods, and design of steel, timber, and concrete structures. *Prereq: EN441.*

EN445 Marine Fabrication Methods (2-2-3). This course presents some of the basic techniques used to fabricate offshore structures and ships. Lecture and lab topics develop an understanding of metal, concrete and composite construction and quality control methods through the manufacturing and testing of small components representative of those used in the marine environment. An understanding of fabrication specifications is developed through group projects in each material category. *Prereq: EN380.*

EN450 Engineering Economic Analysis (3-0-3). Basic methods and reasons for conducting an engineering economic study are presented. Economic criteria are developed. Procedures for making a selection from among a set of technically feasible alternatives are studied. Assumptions and implications associated with these decision-making procedures are discussed. *Prereq: 1/C engineering major or approval of department chair.*

EN452 Structural Reliability (3-0-3). This course provides an understanding of how reliability methods are used to account for the random nature of the sea when designing ocean and ship structures. Methods for the reliability assessment of structures are presented. The role of reliability methods in the design of structures and as the basis for design codes is discussed. Case studies on the use of reliability methods provide the student with real world applications to complement theroretical studies. *Prereq: (EN358 and EN455) or (EN461 and EN475).*

EN455 Seakeeping and Maneuvering (3-2-4). Topics include ship steering, maneuvering, motion and seakeeping. The basic equations of motion for a maneuvering ship and for ship motions in a seaway are developed, and various methods of solution are discussed. The course also covers the experimental aspects of seakeeping and maneuvering. *Prereq: EN353.*

EN456 Advanced Methods in Ship Design (3-0-3). An introduction to computer-aided ship design is presented. Topics include numerical procedures applied to form, stability, resistance, propulsion, motion, maneuvering and strength. *Prereq: EN353 or approval of department chair.*

EN457 Hydrofoil and Propeller Design (3-0-3). The analysis and design of hydrofoils and marine propellers are presented. Lifting line and lifting surface theories are applied to naval devices. Design and towing tank work supplements recitations. *Prereq: EN353 or approval of department chair.*

EN458 Advanced Marine Vehicles (2-2-3). Modern watercraft discussed include multihulls, planing boats, hydrofoil craft, and surface effect vehicles. Analysis and design features are investigated experimentally in the towing tank when appropriate. *Prereq: EN353.*

EN461 Ocean Systems Engineering Design I (3-0-3). Engineering design is introduced as an interdisciplinary activity coupling such subjects as applied probability and statistics, cost assessment, decision-making, economic evaluation, engineering ethics, and project planning. Instruction in hydrographic surveying and profiling, computer-aided drafting, and design report preparation and presentation is included. *Prereq: 1/C standing in ocean engineering major.*

EN462 Ocean Systems Engineering Design II (1-4-3). The conceptual design of an ocean engineering system is accomplished by midshipmen teams. Projects are selected to match student interest and vary each semester, but normally incude such areas as coastal shore protection, marinas, offshore structures, tidal wetlands, artificial reefs, ocean energy systems, underwater vehicles, diving and life support systems. Design teams work independently and integrate detailed engineering design along with other project elements such as proposal writing, project management, cost estimating, report preparation, and oral presentations. *Prereq: EN461.*

EN470 Life Support Systems (3-0-3). The physiological and psychological aspects of man in the sea are presented with the related engineering requirements. Topics include hyperbaric physiology, saturation diving, life support equipment, deep dive systems, diving operations and hazards. *Prereq: 1/C engineering major or approval of department chair.*

EN471 Ship Design I (2-2-3). This course introduces the student to the requirements and procedures for accomplishing the design of a ship. The preliminary design of a small monohull displacement ship is developed. Relevant design resources and techniques are used. *Prereq: 1/C standing in naval architecture major.*

EN475 Ocean Engineering Mechanics (3-2-4). This course investigates the properties of ocean surface waves and the effects of ocean waves on fixed and floating ocean structures. Laboratory experiments are an integral part of the course and include measurements of wave heights, fuid velocities and pressures, wave-induced forces and structure motions in waves. Computational skills are also emphasized both through extensive spreadsheet applications and through programming in MATLAB. *Prereq: EM324, EN245 or approval of department chair.*

EN476 Ship Design II (0-6-3). In this course, which represents the culmination of an undergraduate naval architecture program, the student applies engineering skills to the design of a ship. *Prereq: EN471.*

EN478 Submarine Design Analysis (3-0-3). This course teaches naval architectural design methods specific to submarines, including generation of a concept design. Topics include surfaced and submerged hydrostatics, pressure hull design, resistance and propluson, hydrodynamics and ship handling, system integration, weight estimating, design margins, and operational envelopes. Additionally, midshipmen will gain insight into philosophies behind operating procedures, casualty procedures, and administrative quality controls which allow modern submarines to operate safely. *Prereq: 1/C naval architecture or ocean engineering major.*

Weapons and Systems Engineering Department

Systems Engineering Major

Many modern products, from microwave ovens, stereos and automobiles to spacecraft, missiles and robots, are a complex system consisting of components from many engineering disciplines. The systems engineer seeks to combine and control the diverse components in order to meet specific design specifications.

The Naval Academy's systems engineering program, rated number one in the country for more than ten years, is accredited by the Accreditation Board for Engineering and Technology (ABET). It is an interdisciplinary major encompassing electronics, mechanics, automatic control, computers and simulation. An overall understanding of the analysis and design of complete engineering systems, including the interdisciplinary interfaces between systems, is the primary goal of the major. Systems engineering is particularly suited to those persons interested in the higher level interactions of engineering components rather than the detailed design of specific components. A bachelor of science in systems engineering is awarded. An honors program with a designated honors degree is available for selected students.

Since most modern systems contain automatic control functions using digital control techniques, the core of the systems engineering major is the study of feedback control theory, with digital control as a major element. Surrounding this core is the interdisciplinary part of the major, with advanced courses in digital technology and microprocessors, computer interfacing and engineering, analog and digital communications, analog and digital simulation and robotics. As a part of the interdisciplinary concept, portions of the systems engineering major may be fulfilled with advanced courses from all other engineering disciplines as well as mathematics, physics and computer science.

A systems engineer is particularly well prepared to operate and maintain the most sophisticated systems found in today's Navy. Knowledge gained in the major is directly applicable to missile, gun, sensor, guidance and propulsion systems. The systems engineering major also provides an excellent foundation for postgraduate education in any engineering discipline.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NN200, NS300, NL310, NL400, NS42X;
Mathematics: SM212, SM221, SM316;
Science: SP211, SP212, SI283;
Humanities: HH215 (or HH215A), HH216, and two electives including one at the 300/400 level;
Engineering: EE331, EE332, EM211, EM232, EM318, EM319A, ES300;
Major: ES202, ES301, ES303, ES304, ES308, ES402, ES403, ES405, plus five major electives.

Systems Engineering Courses

ES202 Introduction to Systems Engineering (2-2-3). Introduction to the mathematics, programming and simulation tools of the Systems Engineer. Introduction to analog and digital simulation techniques and modeling of electrical, mechanical and hydraulic systems. Includes a simulation project, a briefing from the 1/C on design projects and a survey of the simulation and control laboratories and courses available in Systems Engineering. *Coreq: SM212.*

ES300 Naval Weapons Systems (3-0-3). An introduction to weapons systems applications of RADAR, electro-optics, SONAR, engagement systems, destruction systems and systems integration. *Prereq: Calculus II (SM122 or SM162), Physics II (SP212 or SP222), and Chemistry II (SC112 or SC151).*

ES301 Analog/Digital Computer Methods (2-2-3). Principles of computer simulation of linear and nonlinear multivariable systems are applied to the study of the behavior of realistic engineering control systems. Includes a hands-on hardware design and construction problem and a computer simulation design project. *Prereq: ES202 and EM232; Coreq: ES307.*

ES303 Linear Control Systems (3-0-3). Analysis and design of linear control systems in the time and frequency domains. *Prereq: ES202 and EM232; Coreq: ES301.*

ES304 Advanced Control Systems (3-0-3). A study of advanced control methods for linear systems including frequency domain control system design, state feedback compensation, and state estimation. *Prereq: ES301 and ES303; Coreq: ES308.*

ES308 Control Systems Design Laboratory (1-2-2). Applied control systems design. Implementation of analog and sample data controllers. *Prereq: ES303.*

ES360 Introduction to Controls Engineering (0-2-1). An introduction to the engineering principles used in the control of weapon systems. Includes modeling physical systems using transfer functions, solving system parameters using output from a known input and adjusting system parameters to achieve a desired output. *Prereq: Calculus II, Chemistry II, Physics II.*

ES402 Systems Engineering Design (2-4-4). Introduction to the macro-techniques of engineering design including performance, reliability, management control, redundancy, man-machine systems and testing techniques. Design, construction, test and evaluation of an approved project is accomplished in the lab. *Prereq: ES308 and (ES405 or ES302).*

ES403 Engineering Design Methods (1-2-2). An introduction to the engineering design process and project management. Also includes the composition of the proposal for the senior design project. *Prereq: ES308; Coreq: ES405.*

ES405 Applied Actuators and Sensors (2-2-3). Computer controlled instrumentation is used to collect data for determination of mathematical model parameters of physical systems using statistical analysis. Comparisons of predicted and actual systems responses are made. Includes lab exercises with sensors, sensor operation, and hardware design of DC and stepper motor controls. *Prereq: ES304 and ES308.*

ES410 Control Systems and Their Application to Weapons (3-2-4). Linear control systems for engineering majors, using analytical, graphical and computer techniques. *Prereq: ES300, SM212 or SM222, and EE221 or EE331.*

ES413 Digital Control Systems (2-2-3). Analysis, design and simulation of digital filters. Analysis, design and laboratory testing of digital controllers for continuous processes using digital and analog computers and servo system hardware. *Prereq: ES308 or ES410.*

ES418 Modern Control Systems (3-0-3). Analysis and design of control systems using modern control theory. *Prereq: ES304 or ES401.*

ES421 Digital Information Systems (2-2-3). Introduction to the tools required to study digital and analog communications systems including Fourier analysis, sampling correlation, convolution and windowing. Analysis of different ways to encode digital communication signals. *Prereq: 1/C engineering major or approval of department chair.*

ES422 Analog Information Systems (2-2-3). Study of amplitude and frequency modulation techniques. Develop models of receiver structures for extracting signals from a noisy environment. System identification of unknown black boxes using time and frequency domain techniques. *Prereq: ES421.*

ES430 Introduction to Computer Engineering (2-2-3). An introduction to logic operations starting with Boolean algebra and switching circuits up to an introduction of the logical organization and internal functioning of computers. Lab exercises include combinatorial logic design, sequential logic design, computer functional simulation and a three-chip computer project.

ES432 Microcomputers in Control Applications (2-2-3). An introduction to the role of the microcomputer as a component in control systems, applying assembly language programming techniques and a variety of interface hardware. *Prereq: ES430 or approval of department chair.*

ES450 Introduction to Robotic Systems (2-2-3). Fundamentals of robotic systems including historical development, applications, basic configuration and design considerations, control principles of robot systems, computer vision processing and a group design project. *Prereq: 2/C engineering major or approval of department chair.*

ES451 Mobile Robot Design (1-4-3). An experimentation-based course in the design, analysis, construction, control and programming of autonomous mobile robots. Special topics include locomotion methodologies (including walking machine design), design for terrain, analog robot designs, alternative actuation techniques (Shape Memory Alloys, etc.) microprocessor selection and integration, motion planning, behavior-based program structures, and power supply systems. Eight to ten robots are constructed by each team throughout the semester using standard robotic construction kits. All topics are investigated through experimentation in the laboratory. *Coreq: ES450.*

ES452 Advanced Topics in Robotics (2-2-3). Individual and group open-ended investigations of selected advanced topics in the field of robotics, such as: advanced computer vision processing techniques, multiple robot manipulator systems, and artificial neural network systems. Utilizes networked PCs, laboratory robots, computer vision systems. *Prereq: ES450 or approval of department chair.*

ES453 Introduction to Computer Vision (2-2-3). An introductory course covering both theory and application of image processing and pattern recognition techniques used for automation, medical imaging, and remote sensing. *Prereq: SI283 or approval of department chair.*

ES456 Autonomous Vehicles (2-2-3). Advanced topics in dynamics, navigation and control applied to a variety of unmanned vehicles, including ground, air, and marine vehicles. *Prereq: ES418 or ES450.*

ES461 Quantitative Methods for Management (3-3-0). An introduction to Operations Research and its application to engineering. Topics include: optimization of engineering systems, game theory, sensitivity analysis, project management with PERT/CPM, and decision analysis. *Prereq: approval of department chair.*

ES462 Emerging Technologies (3-3-0). Focuses on skills and toolsets for evaluation of new and emerging technologies using a sociotechnological development model. Includes discussions of basic science state-of-the-art technologies and current research trends in a variety of emerging areas, including biotechnology, nanotechnology, and cybernetics. Credit cannot be received for both ES462 and ES503. *Prereq: 1/C ESE major or approval of department chair.*

ES502 Honors Research and Design (1-2-2). Engineering design process and project management geared towards advanced projects associated with the Systems Engineering Honors Major. Includes the composition of the proposal for the honors senior research project. *Prereq: 2/C ESEH major.*

ES503 Advanced Technologies (3-0-3). This course provides students with background and insight into the implications of emerging technologies, focusing on the impact of these technologies from a global, societal perspective. Students use fundamental scientific and engineering skills to analyze state-of-the-art technologies and predict directions of future expansion and application of these systems. Sample topics include nanotechnology, cybernetics, genetic engineering, and intelligent highway vehicle systems. *Prereq: 1/C ESEH major.*

Division of Humanities and Social Sciences

Economics Department
English Department
History Department
Language Studies Department
Political Science Department

Economics Department

Economics Major

The major in economics is designed to acquaint prospective naval officers with both macro- and micro-economic theory, quantitative methods in economics, economic problem-solving in an institutional context and international economic relations of the United States. A bachelor of science degree is awarded. An honors program with a designated honors degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400,NN200, NS300, NS42X;
Mathematics: SM223; plus either SM219 or SM230 or SM239 or SM212;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives outside the major including one at the 300/400 level;
Language: Four semesters of a modern language;
Engineering: EA400 or EN400 or EN401, EM300; EE301, EE302, ES300, ES360, and a free elective.
Major: FE210, FE312, FE331, FE341, FE475, and five major electives, three at the 400 level.

Economics Courses

FE210 Introductory Economics (3-0-3). A course in elementary economic theory with applications to contemporary problems. Topics include determination of GDP, price theory and market equilibrium, monetary and fiscal policy, unemployment, inflation and international trade. *Prereq: none.*

FE220 Accounting (3-0-3). An introductory course in the basic principles of accounting. Cannot be taken for humanities/social science credit. *Prereq: none.*

FE301 Financial Analysis (3-0-3). A study of the theory and techniques of financial analysis applied in the federal government and industry. *Prereq: FE210.*

FE310 Economic Geography (3-0-3). Provides a systematic understanding of economic growth and the issue of finite limits to improved living standards around the world. Studies population growth, the resources of the principal nations of the world, industry location, international trade, commodity cartels and the requirements for continued technological advances. *Prereq: FE210 or approval of department chair.*

FE311 History of Economic Thought (3-0-3). Traces the evolution of economic doctrine from the ancients to modern day with emphasis on the period since the 18th century. Reviews the contributions to economic knowledge by Smith, Malthus, Ricardo, Marx, Mill, Marshall, Keynes and others. Various schools of thought, including mercantilism, classical, neo-classical, historical, institutionalism and Keynesianism are examined. *Prereq: FE210.*

FE312 Macroeconomics (3-0-3). A course on the theories of the aggregate level of income, employment and the price level. Includes discussion of determinants of economic growth, the interaction of the domestic economy with the world economy, and the formulation and impact of monetary and fiscal policy. *Prereq: FE210.*

FE314 International Trade Policy (3-0-3). Study of international trade and finance, emphasizing policy and the institutions that shape policy. We will consider why countries trade, why some countries use tariffs and other barriers to trade, how international financial markets work, why so many countries now participate in regional trade arrangements, and the benefits and costs associated with globalization. *Prereq: FE210 or FP210.*

FE315 Economics of Developing Nations (3-0-3). Study of the economic characteristics, problems and policies of developing nations, covering economic growth patterns in Third World nations, their changing role in the international economic order and the different economic routes being employed toward economic progress. *Prereq: FE210.*

FE320 Cost Accounting (3-0-3). A study of concepts and techniques of cost accounting. Primarily concerned with the derivation of production cost arising from materials, labor, services employed and overhead. Cannot be taken for HUM/SS credit. Not offered every year. *Prereq: FE220.*

FE321 Comparative Systems and Transitional Economies (3-0-3). The study of the structure and performance of alternative forms of economic organization, capitalist, socialist/communist, and mixed economic systems, and the study of the conversion of socialist systems to capitalism with particular focus on eastern European countries and the former Soviet republics. Not offered every year. *Prereq: FE210.*

FE331 Economic Statistics (2-2-3). Survey of descriptive and inferential statistical techniques involving more than one variable. Strong emphasis on regression analysis and use of computers. *Prereq: FE210 and (SM219 or SM230 or SM239).*

FE334 Financial Markets and Institutions (3-0-3). A study of financial institutions and instruments covering their development and role within the economy and financial system. The forces creating the rapid changes of financial institutions and instruments in the 1980s and 1990s are explored, as well as the regulation of financial institutions and markets. *Prereq: FE210 or approval of department chair.*

FE335 Economics of National Defense (3-0-3). The application of economic analysis to defense decision-making and the consequences of defense decisions for weapons; volunteers vs. conscription; leaders vs. resource managers; competitive vs. monopoly contractors; pay vs. non-pay factors in reenlistment. *Prereq: FE210 or approval of department chair.*

FE337 Economics of the Defense Industrial Base (3-0-3). Application of economic principles to issues relating to military procurement and contracting, conversion of military industrial capacity to peacetime uses, wartime mobilization of industrial capacity, strategic stockpiling and economic warfare. *Prereq: FE210.*

FE341 Microeconomics (3-0-3). Theories of the economic behavior of consumers and producers, the determination of final good and factor prices, market structures and general economic equilibrium. The application of price theory to business problems and public-policy issues. *Prereq: FE210.*

FE342 Economic Methods for Engineers (3-0-3). Application of microeconomic principles and analytical tools to the costing of investment projects in both private and public/military contexts. *Prereq: FE210.*

FE345 Environmental Economics (3-0-3). Economic evaluation of policies involving conflicting public and private uses of natural resources. Topics include environmental benefit and cost measurement, causes and consequences of pollution, management of depletable and renewable resources and the economics of energy. Not offered every year. *Prereq: FE210.*

FE354 Development of the U.S. Economy (3-0-3). Economic theory is used to analyze the evolution of the U.S. economy; among topics considered are the American Revolution, westward expansion, slavery, industrialization, market concentration and the Great Depression. *Prereq: FE210 or approval of department chair.*

FE362 The Economics of Technology (3-0-3). An analysis of productivity growth, characteristics of invention and innovation, determinants of research and development activities of government and business; the economic impact of automation and reindustrialization. Not offered every year. *Prereq: FE210.*

FE363 Macroeconomics (2-2-3). A course on the theories of the aggregate level of income, employment and the price level. Includes discussion of determinants of economic growth, the interaction of the domestic economy with the world economy, and the formulation and impact of monetary and fiscal policy. Laboratories involve work with a large macroeconomic model. *Prereq: FE210.*

FE400 Advanced Microeconomic Theory (4-0-4). Advanced topics in modern microeconomics with particular emphasis on dynamic analysis, the role of risk and uncertainty in economic decision making, general equilibrium analysis and welfare economics. *Prereq: FE341.*

FE405 Advanced Macroeconomic Theory (4-0-4). The purpose of this course is to utilize the tools and intuition from microeconomics, and statistics to understand the structure and workings of capital markets. We take the standpoint of an economic researcher who wants to understand the prices and quantities that are observed in the finanacial markets, rather than the perspective of an individual who wants to make a fortune in the stock market. By the end of the course, one should have a clear understanding of how to price a financial security and the central role the notions of risk-return trade off, consumer optimality, and no-arbitrage play in achieving this. *Prereq: FE312.*

FE411 Economic Development and Growth (3-0-3). This course provides a rigorous study of the current issues facing developing countries on both the individual and aggregate level. Topics to include such issues as human capital investment, provision of heath care resources, trade and globalization, government institutions, foreign aid and growth during times of structural change. Individual country case studies may also be presented. *Prereq: FE312 or FE341.*

FE412 International Trade and Finance (3-0-3). A rigorous examination of current international issues in a theoretical and empirical framework. Topics include motivations for trade; trade versus protectionism; the multinational enterprise; exchange rate issues and the international monetary systems, and the role of the International Monetary Fund and World Bank. *Prereq: FE312 or FE341.*

FE422 Labor Economics (3-0-3). A study of the distribution of income with emphasis on the demand for and supply of labor services; the choice-theoretic behavior of firms and individuals in the determination of wages and the employment level. Topics analyzed include human capital theory, occupational choice, the unemployment-inflation relationship and the wage effects of discrimination and unions. *Prereq: FE341.*

FE431 Public Finance (3-0-3). The use of government expenditures and taxation in a market economy to change the allocation of resources and to modify the distribution of income. Examination of the economic effect of government budgetary policy. Microeconomic theory and federal tax and budgetary institutions are emphasized. *Prereq: FE341.*

FE434 Money and Banking (3-0-3). A consideration of central and commercial banking institutions; an investigation of the demand for money and its role as a focal point for monetary policies designed to obtain full emplyment, price stability and international monetary equilibrium. *Prereq: FE312.*

FE435 Macroeconomic Forecasting (3-0-3). As a forward-looking discipline, economists use forecasting as the basis for private sector decision making. Moreover, businesses and governments forecast future revenues and costs. Macroeconomic Forecasting examines the modern, quantitative, statistical-econometric techniques of producing and evaluating forecasts of macroeconomic variables. The course introduces the fundamental techniques to analyze trend, seasonality and cyclical fluctuations and the development of simultaneous equation models of the economy. *Prereq: FE312 and (SM230 or SM219).*

FE436 Business Cycles (3-0-3). An advanced treatment of the empirical and theoretical issues surrounding business cycles. Topics include empirical regularities of cycles, models of inventory cycles, labor and credit markets, technology shocks and the international transmission of cycles. Simulation-based methods of analyzing such models, and the role of fiscal and monetary policy in economic stabilization are included. *Prereq: FE312.*

FE437 Monetary Theory and Policy (3-0-3). An advanced study of topics in monetary economics and their application to macroeconomic issues. Consideration of the role of money as a medium of exchange in commodity and fiat systems. Theories of money demand and empirical measures of the money supply. Development of macroeconomic models of money and the effect of monetary policy on inflation, unemployment and economic growth. *Prereq: FE312.*

FE445 Econometrics (3-0-3). Quantification of basic economic theory; multiple regression, correlation and identification techniques for the construction and testing of economic models and a study of selected alternative models of particular economic interest. *Prereq: FE341, Calculus II, and (FE331 or SM339).*

FE450 Game Theory (3-0-3). Game theory is the study of strategic behavior in situtations where decision makers are aware of the interdependence of their actions. While game theory is widely applicable in social and biological sciences, this course introduces the basic notions of game theory with emphasis on economic applications such as auctions, oligopoly pricing, and entry deterrence. In particular, the course introduces students to the fundamental problems and solution concepts of non-cooperative game theory by examining both simultaneous and sequential move games, static and dynamic games, and games with imperfect and asymmetric information. *Prereq: FE341.*

FE460 Public Policies Toward Business (3-0-3). An examination of public regulation of private enterprise in the U.S. with emphasis on the rationale for and application of antitrust policy and direct regulation. *Prereq: FE341.*

FE461 Industrial Organization (3-0-3). Industrial organization is the study of industry and firm behavior. Using microeconomic and game theory tools, this course explores the relationships among firms in an industry or across industries by examining the nature of strategic interaction among firms. The course will utilize available computer software to study theoretical models and empirical evidence for a wide variety of market phenomena such as price wars, patent races, price-fixing conspiracies, mergers, and advertising campaigns. It will also consider public policies that affect the structure of markets and the behavior of firms, particularly antitrust laws, which try to create a balance between the benefits of coordination and consolidation and the detriments of market power. This course counts as a restricted FE major elective for economics majors and as an economics major elective for the quantitative economics major. *Prereq: FE341.*

FE462 Information Economics (3-0-3). An exploration of the basic theory of information in economics, with special reference to the valuation of information. Students apply microeconomics in solving problems in the allocation, distribution, storage, and transportation of information. Students learn the unique features of markets for information, and the institutional and regulatory environment within which information markets function. *Prereq: FE341 or FE341Q.*

FE475 Research Seminar (3-0-3). Directed research on a specific topic; capstone to economics major. Emphasis on empirical work using computers. *Prereq: 1/C FEC major.*

FE500 Honors Research Seminar I (2-0-2). Examination of techniques and methodology of social science research; students will choose topics for development in FE506. *Prereq: 1/C FECH major.*

FE506 Honors Research Project (1-6-4). Directed independent research on topics chosen in FE500. Emphasis on empirical work using microcomputers. *Prereq: 1/C FECH major.*

English Department

English Major

The majors program in English offers study of the most significant and influential writings of civilization from ancient times to the present as well as the opportunity for independent study and for creative writing projects. A bachelor of science degree is awarded.

An honors program with a designated honors degree is available for selected students. Built on the premise that students wishing to excel will do so within the framework of the regular major, the honors program requires concentration in literary period courses and participation in seminars focusing on literature and the fine arts and on advanced literary topics.

In addition to the honors program, midshipmen may take advantage of the Trident Scholar program, study abroad, and poetry and playwriting competitions. The department of English also arranges a full schedule of trips to cultural centers in Washington and Baltimore to take advantage of musical and dramatic offerings. For those inclined to be on the stage themselves, the Masqueraders, a highly regarded drama group, offers a major production each year.

Choosing a major in English will not limit career selection in a highly technical Navy or Marine Corps. The qualities of a superior officer must include creativity, communicaton skills and independent thinking, all of which are strongly encouraged in English classrooms.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM223; plus either SM230 or SM212;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives outside the major including one at the 300/400 level;
Language: Four semesters of a foreign language;
Engineering: EN400 or EN401, EM300, EE301, EE302, ES300, ES360, and a free elective;
Major: HE217, HE218, HE333, and seven major electives.

English Courses

HE101 Practical Writing (3-0-3). The study and practice of grammatically correct and rhetorically effective expository prose, supplemented by the analysis of essays by professional writers. For students selected by English Department. *Prereq: Placement by deparment chair.*

HE111 Rhetoric and Introduction to Literature I (3-0-3). The first of a two-course sequence stressing the writing of rhetorically effective and grammatically correct expository prose. During the first semester students read essays, short stories and plays, and they write brief essays. During the second semester students read novels and poetry and write longer essays. *Prereq: none.*

HE112 Rhetoric and Introduction to Literature II (3-0-3). Continuation of HE111. See HE111 for a listing of topics. *Prereq: HE111.*

200-Level Courses: General Description

The literary content of courses on this level is eclectic. These courses offer wide surveys of materials from different cultures, historical periods, literary types and issues. In each course substantial practice in writing is to be expected. If a term paper is required, prior to the submission of such a paper there will also be several essays or written exercises to test and evaluate the student's writing competence. There are no prerequisites for any course in the 200 group. They may be taken at any class level, including the fourth-class year.

HE217 Early Western Literature (3-0-3). A balanced survey of the Western literary tradition and its backgrounds, from ancient Greece through the Middle Ages. Readings will include classical Greek and Roman epic, drama and philosophy; selections from the Bible; and medieval poetry, drama and philosophy. *Prereq: none.*

HE218 Anglo-American Literature (3-0-3). A balanced survey of British and American literary history from the Renaissance through the early twentieth century. The course emphasizes the movements that have shaped our tradition: Renaissance humanism, empiricism and skepticism, Romanticism and transcendentalism, realism and naturalism, and modernism. *Prereq: none.*

HE222 The Bible and Literature (3-0-3). The Bible and its influence on European and American literature. Emphasis will be placed on modern biblical literary-critical methodology and on the symbolic richness of derivative literature from Dante to Nikos Kazantzakis. *Prereq: none.*

HE224 Literature and Science (3-0-3). The interrelationships among science, technology and literature. The course considers both the impact of science on literature and the implications of science as reflected in literary responses. *Prereq: none.*

HE250 Literature of the Sea (3-0-3). Study of sea literature from the epic to the novel, with an emphasis on literary qualities, human relationships with the sea and problems of command. *Prereq: none.*

HE260 Literature of War (3-0-3). A multi-genre survey of war and its consequences as represented in classic and contemporary literature with an emphasis on such issues as individual responsibility, leadership, societal values, military culture. *Prereq: none.*

300-Level Courses: General Description

These courses build on the foundations of literary analysis, comprehension and writing acquired in HE111-112. The HE301-306 series goes more deeply into each of the basic literary types; the HE313-333 series approaches literature in its historical and cultural dimensions while focusing on a limited historical period; the HE343-344 series offers extensive practice in a variety of writing forms. All courses have a writing requirement intended to further the student's opportunity to improve skills. *Prerequisites for all 300-level courses are HE112.*

HE301 Patterns in Drama (3-0-3). A study of drama, emphasizing reading, viewing, and analyzing dramatic literature and performance. *Prereq: HE111 and HE112.*

HE302 Forms of Poetry (3-0-3). A study in the analysis of poetic form and expression. *Prereq: HE111 and HE112.*

HE306 Types of Fiction (3-0-3). A study of the novel and short story with particular emphasis on the conventions, techniques, and innovations in the form. *Prereq: HE111 and HE112.*

HE307 Topics in Film and Literature (3-0-3). A study of American, European and world films in conjunction with relevant literary works. *Prereq: HE111 and HE112.*

HE313 Chaucer and His Age (3-0-3). The literary and philosophical traditions of Chaucer, the Gawain poet, and other contemporaries, including early and late medieval writers from England and the continent. *Prereq: HE111 and HE112.*

HE314 The Renaissance Mind (3-0-3). Literature and thought of the period bracketed by the two great English epics, Spenser's *Faerie Queene* and Milton's *Paradise Lost*. The course includes a continental perspective, with readings from such authors as Machiavelli, Rabelais, Cervantes, Montaigne and Castiglione. *Prereq: HE111 and HE112.*

HE315 Restoration and 18th Century Literature (3-0-3). The literature of the period 1660-1780. Readings may include the plays, novels, satires, and poetry of such writers as Behn, Dryden, Swift, Defoe, Fielding, Pope, Steele, Sheridan, and Johnson. *Prereq: HE111 and HE112.*

HE317 The Romantic (3-0-3). Literature and culture of the Romantic period in Britain from the 1780s to the 1830s. Readings may include works by such writers as Blake, Wordsworth, Coleridge, Austen, the Shelleys, Byron, and Keats. *Prereq: HE111 and HE112.*

HE318 Modern British Literature (3-0-3). The literature of Great Britain and Ireland since 1900. Readings may include the novels of Conrad, Joyce, Lawrence, Woolf, and Lessing; the plays of Shaw, Synge, O'Casey, and Pinter; the poetry of Hardy, Yeats, Eliot, Auden, and Dylan Thomas. *Prereq: HE111 and HE112.*

HE319 Victorian Literature (3-0-3). British literature from the 1830s to the end of the nineteenth century. Readings may include works from such authors as Dickens, the Brontës, George Eliot, Hardy, Tennyson, the Brownings, Arnold, Carlyle, and Darwin. *Prereq: HE111 and HE112.*

HE320 Contemporary British Literature (3-0-3). British literature from 1945 to the present day. Reading may include the novels of Orwell, Greene, Murdoch, Naipaul, Barnes, Ishigura, and Zadie Smith; the plays of Beckett, Pinter, Orton, Stoppard, Churchill, and Friel; and the poetry of Larkin, Heaney, Hughes, Gunn, and Motion. *Prereq: HE111 and HE112.*

HE326 American Literature, 1607-1860 (3-0-3). A survey of American literature including the Native American tradition from European settlement to the Civil War, emphasizing the relationship between the emerging culture and literature. Readings may include works from such authors as Bradford, Bradstreet, Franklin, Wheatley, Cooper, Emerson, Thoreau, Poe, Hawthorne, Melville, and Douglass. *Prereq: HE111 and HE112.*

HE328 American Literature, 1860-1914 (3-0-3). A survey of American literature from the Reconstruction through the Gilded Age, emphasizing the rise of realism and naturalism. Readings may include works from such authors as Whitman, Dickinson, Twain, Howells, Crane, Dreiser, Chesnutt, Chopin, James, and Wharton. *Prereq: HE111 and HE112.*

HE329 American Literature, 1914-1945 (3-0-3). A survey of American literature between the wars. Readings may include works by such authors as Stein, Eliot, Faulkner, Fitzgerald, Hemingway, Hughes, Hurston, Larsen, O'Neill, Steinbeck, West, and Wright. *Prereq: HE111 and HE112.*

HE330 American Literature, 1945-Present (3-0-3). A survey of American literature and culture since World War II. Readings may include works by such authors as Ellison, Ginsberg, Lowell, Bishop, Baraka, Heller, Pynchon, Bellow, Plath, Sexton, Rich, Roth, Updike, DeLillo, Mamet, McCarthy, and Morrison. *Prereq: HE111 and HE112.*

HE333 Shakespeare (3-0-3). A study of representative sample of Shakespeare's tragedies, histories, and comedies. Readings may also include works by Shakespeare's contemporaries. *Prereq: HE111 and HE112.*

HE340 African-American Literature (3-0-3). A survey of representative African-American literature from such figures as Wheatley, Tommer, Hughes, Hurston, Wright, Ellison, Baldwin, Baraka, Brooks, Hayden, Wilson, and Morrison. *Prereq: HE111 and HE112.*

HE343 Creative Writing (3-0-3). An introduction to the writing of prose, poetry, and drama. *Prereq: HE111 and HE112.*

HE344 Professional Communication (3-0-3). A study of advanced methods of presenting information in a wide variety of forms. Assignments may include preparing articles, reports, and military documents. Students may be asked to design and present a persuasive or analytical speech. *Prereq: HE111 and HE112.*

HE353 Topics in Continental Literature (3-0-3). This course explores the variety of works produced from the Renaissance to the rise of the European Community, emphasizing the exchanges between social and literary history and the interactions between cultures. *Prereq: HE111 and HE112.*

HE355 Topics in Multi-ethnic Literature (3-0-3). This course considers literature that raises questions of race and ethnicity, postcolonial responses to hegemonic culture, canon formation, and shifting definitions of nation and subjectivity. Readings may include the works of Achebe, Cisneros, Coetzee, Gordimer, Marquez, Rushdie, and Tan, among others. *Prereq: HE111 and HE112.*

HE360 Special Topics in Literature (3-0-3). An open-topics literature course. Specialized offerings vary from semester to semester. *Prereq: HE111 and HE112.*

400-Level Courses: General Description

The HE400 series allows students and English department faculty members with special expertise to pursue together an intensive study of a restricted literary subject. Emphasis in each course will be upon extensive and intensive reading in a limited body of material, techniques of research and the development of independent critical judgment. *Prerequisites for these courses are at least one 300-level English course and permission of the chair.*

HE442 Literary Theory (3-0-3). A survey of key problems, figures, and texts in the history of literary and culture thought. Required of all honors English majors. *Prereq: one 300-level English course and permission of the department chair.*

HE461 Studies in a Literary Period (3-0-3). In-depth study of a limited period in literary history. For example: the Augustan period, the beginnings of Romanticism, the fin de siecle, and the 1960s in American literature. *Prereq: one 300-level English course and permission of the department chair.*

HE462 Studies in a Literary Problem (3-0-3). In-depth study of a problem that cuts across traditional divisions of nationality, historical period, or genre. For example, myth and symbol in literature, literature and science, and the concept of the hero. *Prereq: one 300-level English course and permission of the department chair.*

HE463 Studies in Literary Figures (3-0-3). Extensive reading in the works, biography, and criticism of major figures in world literature. For example: Milton, Wordsworth, George Eliot, Dickens, Dostoevsky, O'Neill, Melville, Faulkner, Stevens, Morrision. *Prereq: one 300-level English course and permission of the department chair.*

HE467 Studies in a Literary Genre (3-0-3). Study in a special genre. For example: the epic, the autobiographical novel, science fiction, Imagist poetry. *Prereq: one 300-level English course and permission of the department chair.*

HE503 Seminar in Arts and Literature (3-0-3). An interdisciplinary honors seminar concerning a special topic in literature and the arts. *Prereq: 1/C Honors English majors or by permission of the department chair; Coreq: HE521.*

HE504 Seminar in an Advanced Topic (3-0-3). A concentrated honors seminar exploring individual literary works or issues. *Prereq: 1/C Honors English majors or by permission of the department chair; Coreq: HE522.*

HE521 Honors Supplement I (1-0-1). Focused study of a topic generated in HE503. *Prereq: none; Coreq: HE503.*

HE522 Honors Supplement II(1-0-1). Focused study of a topic generated in HE504. *Prereq: none; Coreq: HE504.*

History Department

History Major

The major in history provides an opportunity to examine the evolution of past civilizations and to evaluate and understand the institutions, achievements, ethics and values of mankind through the ages. History majors learn to evaluate ideas critically: to sift evidence, to draw conclusions and to express their conclusions clearly and concisely. A clear understanding of the events of the past provides a more acute awareness of contemporary issues and problems, as well as a context and a process for evaluating those problems. The program includes introductory courses on the values and ideas of western civilization in a global context and on the history of the United States Navy and Marine Corps. A bachelor of science degree is awarded.

In addition to the three history courses in the core curriculum (HH104, HH205 and HH206), each history major will also take Perspectives on History (HH262) and a Seminar in Advanced Historical Studies (HH462). These courses introduce the students to historiography and the techniques of historical research and writing and enable them to pursue a historical issue in depth. To ensure disciplinary breadth, the department also requires each history major to select upper division courses from four of the five of the following fields of historical study: American, European, Regional (non-Western), Thematic/Interdisciplinary and Naval/Military.

The Honors program in history offers students with superior ability in history the opportunity to pursue a more challenging course of study and graduate with Honors in History at Commissioning. Those students accepted for the program will work closely with a faculty adviser and develop a major research paper (HH509) in the fall of first class year. The History department also requires Honors History majors to take two special seminars, HH507 (Honors Historiography) and HH508 (Honors Colloquium).

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM223; plus either SM230 or SM212;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives outside the major including one at the 300/400 level;
Language: Four semesters of a foreign language;
Engineering: EN400, EM300; EE301, EE302, ES300, ES360 and a free elective
Major: HH262, HH462, and eight major electives.

History Courses

HH104 American Naval History (3-0-3). This course examines the antecedents, origins and development of the United States Navy within the framework of America's growth as a continental and, eventually, global power, with particular emphasis on the development of naval and maritime strategy. *Prereq: none.*

HH215 The West in a Global Context: Origins Through the Enlightenment (3-0-3). Analyzes the historical evolution of ethical thought and its impact upon European society and culture from Antiquity to the Enlightenment. The course sets the evolution of Western values in a larger, comparative context of world religions and values. By studying the cultural expressions of Western Ethical concerns, ideals and aspirations in light of other civilizations, this course broadens knowledge of the West's global context and cultivates the development of critical thinking about human beings and their societies. HH215 examines the critical moral and political choices made by societies and individuals through the ages in order to illuminate and deepen the student's understanding of the competing values, institutions and challenges of the modern West. The course fulfills the graduation requirement listed on matrices as HH2XY. *Prereq: none.*

HH215A Asia in a Global Context (3-0-3). This course is designed to provide an alternative to HH215 "The West in a Global Context." It introduces students to pre-modern Asian civilization, including China, India, Japan and Southeast Asia. This course traces the dynamic manifestations of cultural, political, military and intellectual patterns, and examines them through a global perspective. Topics include Asian ways of war, as embodied in the Chinese art of war, the Mongol campaigns, Japanese samurai, and Buddhist and Hindu warrior kings. Moreover, students will encounter ancient Asian sages and their ethical ruminations not only in their own regard, but also in comparison with their counterparts in other world traditions including Classical, Judeo-Christian and Islamic cultures. The course fulfills the graduation requirement listed on matrices as HH2XY. *Prereq: none.*

HH215M The Middle East in a Global Context (3-0-3). This course is designed to provide an alternative to HH215 "The West in a Global Context." It introduces students to pre-modern Middle Eastern civilizations. This course traces the dynamic manifestations of cultural, political, military and intellectual patterns, and examines them through a global perspective. Topics include Middle Eastern ways of war. Moreover, students will encounter ancient Middle Eastern sages and their ethical ruminations not only in their own regard, but also in comparison with their counterparts in other world traditions including Classical, Asian, Judeo-Christian and Islamic cultures. The course fulfills the graduation requirement listed on matrices as HH2XY. *Prereq: none.*

HH216 The West in the Modern World (3-0-3). Focusing chiefly on the period from the 18th century to the present, this course analyzes the most significant political, social, intellectual and economic trends that have shaped contemporary societies. HH216 examines the global impact of European and American cultures over the past three centuries and explores the most important reactions to modernity in both Western and non-Western societies. In doing so, the course situates the West in a global context and prepares students to think critically and comparatively about a changing world. *Prereq: none.*

HH262 Perspectives on History (3-0-3). A methodology course in which majors acquire the basic technical skills required for research and writing in subsequent courses in history and other humanities and social sciences disciplines. May be repeated only to remove a D or F. *Prereq: 3/C HHS major. Coreq: HH215 or HH215A or 215M.*

HH311 Athens: Military Democracy (3-0-3). Examines the origins of Western democracy in 5th-century B.C. Athens. Focus is on the problems of democratic constitutions in settling foreign policy, surviving extended wars, administering foreign territories and dealing with questions of inequality at home. *Prereq: none; Coreq: HH215 or HH215A or 215M.*

HH312 Imperial Rome (3-0-3). Study of the most successful of Western states with emphasis on models for bureaucratization, military defense and the incorporation of various ethnic groups. *Prereq: none; Coreq: HH215 or HH215A or 215M.*

HH315 The Age of Chivalry and Faith (3-0-3). Surveys the history and culture of Western Europe between about A.D. 1050 and about A.D. 1300, the period generally known as the High Middle Ages. The course traces the emergence of two self-defined medieval aristocracies: those who fight (the knighthood) and those who pray (the Christian clergy). Special attention is paid to developments in the socio-political systems of the age, kingship and lordship; to the culture of the medieval aristocracy, chivalry; to movements of religious enthusiasm; and to the evolution of the Catholic Church into a papal monarchy. *Prereq: none; Coreq: HH215 or HH215A or 215M.*

HH316 Age of Religious Wars (3-0-3). Focuses on the emergence of modern civilization (1500-1763) from the discoveries and rediscoveries of the Renaissance, the sweeping changes brought by the Reformation and Counter-Reformation and the excitement of both scientific and political revolution. *Prereq: none; Coreq: HH215 or HH215A or 215M.*

HH321 Revolutionary Russia – Peter the Great to Lenin (3-0-3). A study of Russian history from the founding of Moscow to 1917, examining the domestic and external forces responsible for shaping the structure of Russian society and culture. *Prereq: none; Coreq: HH216.*

HH322 The Rise and Fall of Soviet Communism (3-0-3). An examination of the Revolution of 1917 and the development of the Soviet Union, emphasizing the institutions and policies adopted to meet domestic and foreign problems. *Prereq: none; Coreq: HH216.*

HH326 Ireland and the Irish (3-0-3). This course presents the history of Ireland from the early Christian era to the present, with concentration on the past two centuries. The Great Famine, the independence movement, and the recent "Troubles" are examined in depth. Themes include Ireland's status as Britain's first colony, the role of literature and religion in forming Irish identity and the "diaspora" of Irish people abroad. *Prereq: none; Coreq: HH216.*

HH327 Germany and the Nazi Experience (3-0-3). Focuses on the antecedents of National Socialism, including the Second Reich and World War I eras, the Nazi experience itself, and the legacy it bequeathed to today's German state. *Prereq: none; Coreq: HH216.*

HH329 Modern France: Napoleon to DeGaulle (3-0-3). This course examines France from the revolutionary upheaval of the late 18th century through its role in the Western world since World War II. Roughly the first half of the course will deal with the revolutions of 1789 and 1792 and their impact upon 19th-century France. The second half of the course will consider the experience of France in the 20th century and the changes forced upon the nation by two world wars fought on French soil. *Prereq: none; Coreq: HH216.*

HH330 Imperial Encounters (3-0-3). Great Britain from 1750 to the present. Begins with an analysis of Britain's political and social institutions. It then examines the changes brought about by industrialization at home, revolutions abroad and expansion of the empire. At its end, the course highlights the simultaneous eclipse of Britain as a world power and the increasing prosperity of the masses of the British people. *Prereq: none; Coreq: HH216.*

HH331 Art and Ideas in Modern Europe (3-0-3). Explores the transformation of culture in the modern world. Examines how artists and intellectuals reacted to the long-range impacts of the democratic and industrial revolutions. Emphasis is

placed on development of the fine arts in relation to pivotal ideas from 1750 to present. *Prereq: none; Coreq: HH216.*

HH337 Topics in European History (3-0-3). An open topics history course. Topics vary from semester to semester and cover a variety of specialized themes or eras in European history which are unique or too unusual to be integrated into the regular curriculum. *Prereq: none.*

HH345 Colonial America (3-0-3). Examines the ways in which three diverse cultures–Indian, European, and African–converged on the North American land mass before the American Revolution; topics include French, Spanish and English exploration and settlement patterns, European-Indian encounters, gender, witchcraft, religion, slavery and race, the family, political ideas and institutions, and war and warmaking. *Prereq: none; Coreq: HH216.*

HH346 Revolutionary America and the Early Republic (3-0-3). Covers the remarkable transformation in American society from 1760 to 1820 as thirteen separate and distinct colonies struggled ideologically, militarily and politically to establish a governmental and social system that would suit the needs of a large, diverse, and rapidly expanding population. The background to the Revolution, the actual conduct of the war and the construction of state and national governments are treated in detail. *Prereq: none; Coreq: HH216.*

HH347 Civil War and Reconstruction (3-0-3). An examination of the political, economic and social developments from the origins of the Civil War to 1896, including the wounding of the nation in a civil war and the subsequent reunification. *Prereq: none; Coreq: HH216.*

HH349 Emergence of Modern America 1896-1945 (3-0-3). Examination of political, social, intellectual, diplomatic and economic aspects of American history from the Spanish-American War to the end of World War II. Special emphasis is placed on Progressivism, the emergence of the U.S. as a great power in World War I, the Depression and the New Deal, and World War II. *Prereq: none; Coreq: HH216.*

HH350 United States Since World War II (3-0-3). A detailed examination of American history since 1945, including the onset of the Cold War in the 1950s, the domestic and foreign policy issues of the 1960s, Vietnam, Watergate and the Reagan era. *Prereq: none; Coreq: HH216.*

HH352 Film and American Society (2-2-3). This course explores the relations between motion pictures and the political/cultural life during the period 1930-1943. Films are studied as documents of an era and the extent to which they offer insights for historical understanding are considered. *Prereq: none; Coreq: HH216.*

HH353 American Social History (3-0-3). An examination of American life and culture and the forces that have shaped them, emphasizing mass media, popular entertainment, religious movements and technological advances. *Prereq: none; Coreq: HH216.*

HH354 America in World Affairs (3-0-3). Surveys U.S. foreign relations from the colonial era to recent times, focusing on America's transformation from a colony to a preeminent world power. Examines the causes and international consequences of this dramatic shift, with particular emphasis on the twentieth century—the era of America's greatest influence on world affairs. *Prereq: none; Coreq: HH216.*

HH355 Art and Ideas in American Society (3-0-3). Examines the growth and development of intellectual concepts and artistic creativity in America from colonial times to the present. Emphasizes both the peculiarities of American creative and intellectual accomplishments and the place of those achievements in the broader Western tradition. *Prereq: none; Coreq: HH216.*

HH357 Topics in U.S. History (3-0-3). An open topics history course. Topics vary from semester to semester and cover a variety of specialized themes or eras in American history which are unique or too unusual for integration into the regular curriculum. *Prereq: none.*

HH360 U.S. Sectional History: The South (3-0-3). Surveys the growth and development of the American South with specific attention to the plantation economy and slavery, the Confederate experience, the rise of segregation and the Second Reconstruction. *Prereq: none; Coreq: HH216.*

HH361 History of East Asia (3-0-3). An analysis of contemporary Asian problems which considers their cultural and institutional origins, their 19th-century development under the impact of Western influence and their culmination in contemporary Asian nationalism. *Prereq: none; Coreq: HH206.*

HH362 History of the Middle East (3-0-3). A long-range historical approach to the Middle East's role in world affairs and the development of its cultural, political and military institutions. Emphasis is placed on strategic and diplomatic considerations. *Prereq: none; Coreq: HH216.*

HH363 Modern Latin America (3-0-3). The evolution of Latin American societies from independence to the present will be studied. Analyses of social and political issues like slavery, race, immigration, popular religion, militarism, dictatorship, and revolution will be the focus of the course. Particular emphasis will be placed on Argentina, Mexico, Brazil, Peru, Chile, and Cuba. *Prereq: none; Coreq: HH216.*

HH364 History of Africa (3-0-3). A survey of social, cultural and political developments on the African continent from the era before European colonization to the present. *Prereq: none; Coreq: HH216.*

HH365 Pre-Columbian and Iberian Empires (3-0-3). Pre-Columbian empires like Olmec, Maya, Aztec, and Inca are studied through examinations of their cosmologies, styles of warfare, expansion, imperial consolidation, and collapse. Spanish and Portuguese conquests in America will also be studied by focusing on military campaigns, imperial policies, race, ethnicity, slavery, and church-state relations through the Independence Era. *Prereq: none; Coreq: HH215 or HH215A or 215M.*

HH366 Comparative World Cultures (3-0-3). A team-taught course introducing students to the comparative study of Non-Western societies and cultures before and during their initial contact with the West. *Prereq: none; Coreq: HH215 or HH215A or 215M.*

HH367 Topics in Regional History (3-0-3). An open topics history course. Topics vary from semester to semester and include a wide variety of specialized themes or eras in non-Western history which are too unique or unusual to be integrated into the regular curriculum. Examples of topics include the History of the Mongols and the Balkans. *Prereq: none; Coreq: HH216.*

HH377 Topics in Thematic History (3-0-3). An open topics history course. Topics vary from semester to semester and are often team taught. A variety of historical themes dealing with long term developmental processes will be submitted to detailed analyses. Examples of topics include piracy, the development of national identities and the growth of capitalism. *Prereq: none; Coreq: HH216.*

HH379 History of IT Revolutions (3-0-3). Every age in human history has been an "information age" because in each historical period technologies were devised to gather, process, and disseminate information. This course identifies the most dominant information technologies from the printing press to the palm pilot and attempts to assess their broad historical implications. Special attention will be given to the military-IT nexus. *Prereq: HH104 and FP130.*

HH380 History of Science and Technology (3-0-3). A survey of the history of scientific discoveries and their practical applications, from the early

natural philosophers to the present, with emphasis on the scientific revolution of the 17th century, the Industrial Revolution and the information explosion of the 20th century. *Prereq: none; Coreq: HH216.*

HH381 Warfare in the Middle Ages, 500-1500 (3-0-3). Examines the evolution of warfare and military institutions in Western Europe from the decline of the Western Roman Empire through the Middle Age (ca. 1500). While tactics, strategy, and logistics are examined, the course seeks to place the history of medieval warfare into a political and societal context and show how political, social, technological, cultural, religious, and economic developments shaped and reshaped the way war was waged during the Middle Ages. *Prereq: none; Coreq: HH215 or 215A or 215M.*

HH382 Warfare from the Renaissance to Napoleon (3-0-3). Examines the theory, practice, and nature of warfare on land and sea, both in Europe and European colonies, from about 1500 through the Wars of the French Revolution and Napoleon. Tactical, logistical, technological, and professional developments of Western armies and navies are studied in their political, economic, and social contexts. *Prereq: none; Coreq: HH216.*

HH383 The Age of Total War, 1815-1945 (3-0-3). Surveys the dimensions of warfare and civil-military relations from the end of the Napoleonic era through World War II. *Prereq: none; Coreq: HH216.*

HH384 Recent Military and Naval History (3-0-3). Surveys the dimensions of warfare and civil-military relations from the end of the World War II to the present. *Prereq: none; Coreq: HH216.*

HH385 The U.S. Marine Corps (3-0-3). The historical development of the U.S. Marine Corps is examined by tracing the evolution of its roles and missions, organization, capabilities, and institutional culture. Emphasis is placed on how the Marine Corps has perceived its role in American Society, and how it has been perceived by American society. *Prereq: none; Coreq: HH216.*

HH386 Topics in Naval/Military History (3-0-3). An open topics history course. Topics vary from semester to semester and cover a variety of specialized themes or eras in naval/military history which are too unique or unusual to be integrated into the regular curriculum. *Prereq: none; Coreq: HH216.*

HH462 Seminar in Advanced Studies (3-0-3). Offers midshipmen with a solid base in historical studies an opportunity to pursue the discipline at a level of greater sophistication. Taught in small, intensive seminars; individual sections will engage in a detailed examination of a selected historical topic. Each section will focus on a particular event or problem in history and on the interpretative debates surrounding it. *Prereq: I/C HHS major, or permission of department chair.*

HH480 IT Research Seminar (HH) (3-0-3).

HH507 Honors Historiography (3-2-4). Focusing on the interpretive debates surrounding a particular event or problem in history, students will learn to critically evaluate secondary texts, to discriminate between conflicting interpretations, and to make judgments regarding the merits of different analyses. *Prereq: Admission to the Honors Program in history.*

HH508 Honors Colloquium (3-2-4). Students will propose, conceptualize, and refine their I/C independent research projects. In the process, they will test different historical interpretations, and evaluate different philosophies of history. They will submit a series of short essays culminating in a prospectus specifying both the topic of their Honors research projects and the arguments these projects will advance. *Prereq: HH507.*

HH509 Honor Senior Thesis (3-2-4). With the guidance of a faculty advisor, students prepare analytical research papers interpreting an historical topic of their choice. Each student makes an oral presentation of the finished paper before the faculty-student Honors Committee and external readers. *Prereq: HH507, HH508.*

HH512 Honors Thesis Readings (2-0-2). After selecting a research topic and advisor, history honors students will engage in intensive reading of primary and secondary works related to the topic. *Prereq: HHSH major.*

Language Studies Department

Language Studies Courses, Majors and Minors

The department offers courses at all levels in Arabic, Chinese, French, German, Japanese, Russian and Spanish. Midshipmen majoring in economics, English, history or political science must complete or validate a total of four semesters of a given language and may continue their study of a foreign language at the advanced levels or begin a new language. In other majors, midshipmen who validate a year or more of a language may take language courses at the 200, 300 or 400 levels in that language as humanities or social science electives or as a free elective. Midshipmen in Division I or II majors in the Class of 2011 and earlier may take a first semester course (FL101) in Arabic, Chinese, Japanese or Russian as a free elective and the second semester (FL102) of the same language as a humanities-social science elective. A Division I or II major in the Class of 2012 and later may take as a humanities and social science elective any foreign language, at any level, into which that midshipman has been placed as a result of a language validation exam or by virtue of an interview with Language Studies faculty.

The department offers majors in Arabic and Chinese. The Arabic and Chinese majors consist of ten three-credit courses in Arabic or Chinese language and culture, taught completely in the language, and four three-credit collateral courses, two of which must be outside the major. The major in Arabic allows students to achieve an intermediate to advanced level of language proficiency in Modern Standard Arabic, the lingua franca of the twenty-three countries of the Arab world, while also familiarizing them with many aspects of Arabic cultures, a broad sketch of Arabic cultural history, and major current issues in Arab societies. The major in Chinese provides the opportunity for midshipmen to develop an intermediate level of proficiency in Chinese language for communication, come to a substantial understanding of fundamental aspects of Chinese culture, and develop a comprehensive perspective and an analytical approach toward China (Mainland and Taiwan): its society, people and language.

The department also offers minors in Arabic, Chinese, French, German, Spanish, Russian and Japanese. In French, German and Spanish the minor consists of 12 credit hours at the 300/400 level taken or validated at the Naval Academy. In Arabic, Chinese, Russian and Japanese, the minor consists of 12 credit hours at the 200/300 levels.

The Language Study Abroad Program offers extraordinary opportunities for summer overseas language study in all of the languages taught at USNA.

Language Studies Department

Arabic Major

The major in Arabic allows students to achieve an intermediate to advanced level of language proficiency in Modern Standard Arabic, the lingua franca of the twenty-three countries of the Arab world, while also familiarizing them with many aspects of Arabic cultures, a broad sketch of Arabic cultural history, and major current issues in Arab societies. Communication in speaking and writing and appropriate cultural interaction and idiomatic expression are emphasized at all levels. Students study the language of the media; one of the major Arabic dialects; historical, religious and political discourses; and literature and other cultural manifestations from all ages of Arabic culture and all areas of the Arab world. Fourteen three-credit courses are required for the major: ten mandatory language courses and four collateral courses concerning other aspects of the Arab world, two outside the major. Summer and semester study abroad programs in the target cultures are strongly recommended for Arabic majors. These language and cultural enrichment programs allow students to apply their skills in real-world situations and provide exciting additional opportunities for our students to complete their degrees with significant experience in the Arab World.

Students emerge from the program with a working knowledge of Arabic for use in many different situations, an understanding of Arabic diglossia and its implications, a growing appreciation of the achievements of Arabic cultural history and its contributions to modern global civilization, and a nuanced understanding of the relationship of the Arab world to the United States and other partners of exchange in the world today.

Curriculum requirements: (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM223, plus either SM230 or SM212;
Science: SP211, SP212;
Humanities: HH215, HH216, and two electives outside the major, including one at the 300/400 level;
Engineering: EM300, EE301, EE302, ES300, ES360, EN400;
A free elective;
Major: Ten courses in Arabic language and culture, taught completely in Arabic, and four collateral courses, two of which must be outside the major.

Chinese Major

The major in Chinese provides the opportunity for midshipmen to develop proficiency in the most widely spoken language on earth, Mandarin Chinese. Midshipmen will achieve an intermediate level of proficiency in Chinese language for communication, come to a substantial understanding of fundamental aspects of Chinese culture, and develop a comprehensive perspective and an analytical approach toward China (Mainland and Taiwan): its society, people and language. Fourteen three-credit courses are required for the major: ten mandatory language courses and four collateral courses, two outside the major. One month of study abroad in China is strongly recommended and every attempt will be made to facilitate this. Because of language-specific difficulties in Chinese such as lexical tones, the non-phonetic character writing system, abundant homophones, flexible syntax and word formation, and a highly condensed written discourse style, the language courses begin in the plebe year and continue through eight consecutive semesters.

Majors in Chinese emerge from the program able to read or listen to, with thorough comprehension, long sentences or short paragraphs on topics of daily life and everyday Chinese culture, to use vocabulary items consisting of the 1500 most common Chinese characters, along with sufficient complexity of syntactic and discourse structures to express ideas on the topics listed above with acceptable fluency and accuracy. They will understand the fundamental concepts and structures that distinguish Chinese from English or other languages, as well as the relationship between language structures and aspects of culture. Their collateral courses will enable them to give presentations on and discuss China-related issues from an informed, knowledgeable perspective.

Curriculum requirements: (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM223, plus either SM230 or SM212;
Science: SP211, SP212;
Humanities: HH215, HH216, and two electives outside the major, including one at the 300/400 level;
Engineering: EM300, EE301, EE302, ES300; ES360; EN400
A free elective;
Major: Ten courses in Chinese language and culture, taught completely in Chinese, and four collateral courses, two of which must be outside the major.

Arabic Courses

FA 101 Basic Arabic I (3-0-3). Students learn the rudiments of Arabic language proficiency, ending the semester with the ability to have short introductory conversations about self, family and work, and to read and write in Arabic script, and well-prepared to build their skills in the second semester. The majority of class time is conducted in Arabic. Students are supported with video and audio tapes, and significant written and oral work. We focus on the standard language used throughout the Arab world, with significant treatment of the issues of dialectical Arabic. *Prereq: none.*

FA102 Basic Arabic II (3-0-3). Students further develop their Arabic proficiency skills, broadening the range of topics with which they can deal in language, and deepening their understanding of Arabic grammar and syntax. Students produce Arabic in both oral and written modes, while strengthening their listening and reading abilities. Students become familiar with more complex aspects of Arabic culture through the use of video and audio tapes, with an occasional internet assignment. Students develop the ability to use spoken and written Arabic for a growing set of tasks and situations. *Prereq: FA 101.*

FA201 Intermediate Arabic I (3-0-3). Students continue to develop all their skills in Arabic, with longer, more diverse texts, more complex situations, and more challenging oral and written assignments. Students review, strengthen and refine their grasp of Arabic grammar and syntax, and develop vocabulary bases for an ever-broadening set of fields. Arabic broadcasts, films and authentic contemporary texts are used to supplement the textbook. *Prereq: FA102.*

FA202 Intermediate Arabic II (3-0-3). In this continuation of intermediate Arabic, students supplement their textbook work with a set of sample authentic texts and media from a variety of fields, allowing discussion and writing on more complex ideas, and giving students the opportunity to improve all their language skills, and broaden their skill base. The semester culminates with a short written paper and student classroom presentations all delivered in Arabic. *Prereq: A201.*

FA301 Advanced Arabic I (3-0-3). Using a variety of texts and media, students will work toward greater fluency in spoken and written Arabic. The course, conducted entirely in Arabic, will include reading short stories, articles from the press, film and selections from the Arabic literary heritage. Students will conduct full classroom discussions, write essays and stories, and present results of research in class. *Prereq: FA202 and approval of department chair.*

FA302 Advanced Arabic II (3-0-3). Using exclusively Arabic in the classroom, students will work toward greater fluency in spoken and written Arabic. The course will include the reading and discussion of a short novel or piece of Arabic drama, with discussion of pertinent cultural, historical and political dimensions. The course will emphasize growth in grammatical and stylistic sophistication. *Prereq: FA301.*

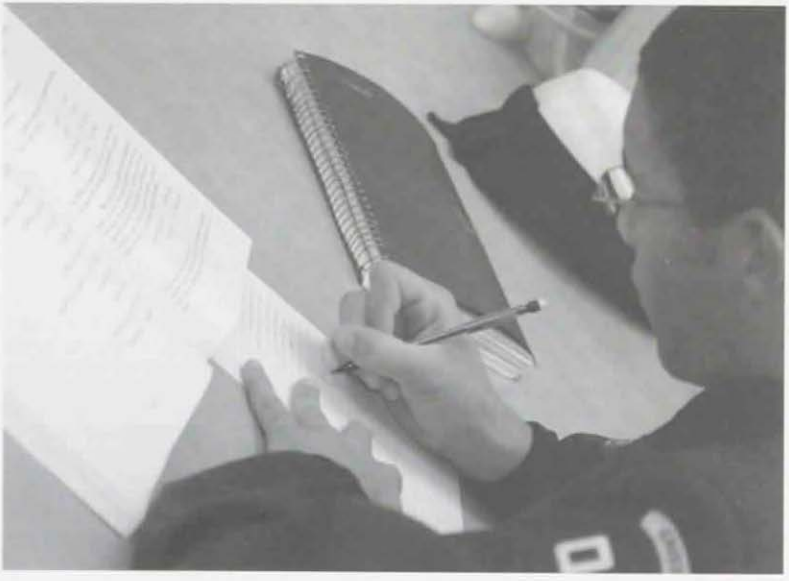
FA325 Media Arabic (3-0-3). This course familiarizes advanced students of Arabic with the broad vocabulary base in widespread use in various popular media. Students read regularly from Arabic newspapers and magazines, view television news broadcasts, access internet sites, and listen to the radio. Classroom discussion deals with issues of comprehension, interpretation, and analysis. Advanced level grammar points and syntactical structures are a focus of instruction and written practice. Refined elements of syntax are introduced so that students can practice writing more complex arguments. Students produce small news items or short articles in Arabic for specific types of media and write a series of short essays exploring issues in the media, using the vocabulary and syntactical structures acquired from class. This work culminates in a longer essay and oral presentation in Arabic on a media topic chosen by the student with instructor approval. *Prereq: FA202 and approval of department chair.*

FA342 Arabic Dialect (3-0-3). This course familiarizes students of Arabic with one of the major dialects of Arabic spoken in the Arab world. Students learn the basics of speaking in the dialect, as well as sounds, forms, idiomatic vocabulary, and grammatical structures which characterize it and differentiate it from Modern Standard Arabic. Student practice speaking extensively, acquiring new grammar structures and vocabulary. Written homework consolidates the new linguistic material presented and practiced in class. Video materials offer students opportunities for discussion in dialect of a variety of topics and situations. The latter part of the course includes complex cultural texts in dialect (e.g. oral poetry or a play), and the consideration of related subdialects. The course culminates with student presentations in dialect. Possible dialects: Egyptian, Levantine, Iraqi, or Yemeni, to be determined by the faculty member teaching the course. *Prereq: FA202 and approval of department chair.*

FA350 Window on Arabic Culture (3-0-3). Using English translations, course explores Arab culture from the Qur'an to current novels and films. Class discusses Arab identities, intellectual contributions of Arabs, and Arab voices on key issues today. Counts as an upper level humanities-social science course. *Prereq: FA202 and approval of department chair.*

FA425 Arabic Discourse in Society (3-0-3). This advanced language course aims to acquaint students with various types of complex Arabic discourse, illustrating aspects of Arabic cultural history, modern Arab societies and cultural movements. Text selections and supplementary audiovisual materials relate to modern and historical political thought, religious thought, cultural criticism, historical investigation, philosophy and literature. Students read and discuss selections in Arabic, analyzing the texts' complex syntactical structures, and evaluating stylistic and rhetorical devices. Writing assignments focus on improving students' composing style, content, and argument structure. *Prereq: FA202 and approval of department chair.*

FA426 Modern Arabic Literature (3-0-3). This course, conducted completely in Arabic, explores samples of highly acclaimed modern Arabic literature from throughout the Arab world. Students read and analyze works by authors from a broad geographical area extending from Morocco to the Arabic Gulf, and extending in time from 1900 to the present day. Recurring themes in modern and contemporary literature, such as cultural and national identity, colonialism, religion, gender relations, and class conflict, are the bases of discussion of the texts and related writing assignments in Arabic. The course entails reading of short stories, a novella or chapters from a longer novel, and poetry. *Prereq: FA301 and FA302, or approval of department chair.*



Chinese Courses

FC101 Basic Chinese I (3-0-3). The first of a two-course sequence using an integrated approach to develop learner's ability to understand, speak, read and write Standard Mandarin Chinese. Communicative skills are developed through various activities in and out of class. Romanized spelling and square characters are taught, as well as pronunciation, sentence structure and basic vocabulary. Cultural exposure accompanies the development of communicative skills. If taken and passed at USNA, may be used as a free elective by Division I and II majors. *Prereq: none.*

FC 102 Basic Chinese II (3-0-3). A continuation of FC101. If taken and passed, may be used in place of a 200-level humanities-social science elective by Division I and II majors. *Prereq: FC101.*

FC201 Intermediate Chinese I (3-0-3). This course continues from the two basic Chinese courses and provides further training of the learner's all-around ability to understand, speak, read and write Standard Mandarin. While emphasis is still placed on communicative skills, the students are expected to extend their vocabulary and grammatical knowledge to a more comprehensive level, to the extent that they could readily and appropriately apply this knowledge to the expression of their own ideas as well as the understanding of more native-style oral and written texts. More cultural exposure is involved to facilitate appropriate communication and more characters are taught to consolidate reading and writing. *Prereq: FC102.*

FC202 Intermediate Chinese II (3-0-3). A continuation of Intermediate Chinese I. *Prereq: FC 201.*

FC301 Advanced Chinese I (3-0-3). The first of a two course sequence which transitions from controlled training in language skills to freer and more authentic communications in Mandarin Chinese. Class activities are purposefully organized and strictly guided. A larger amount of cultural content is loaded in various problem-solving tasks. Character reading and writing are enhanced by the use of dictionaries and by computer input of the Romanized Pinyin system. Daily practice of handwriting and memorization of more characters. *Prereq: FC202.*

FC302 Advanced Chinese II (3-0-3). A continuation of Advanced Chinese I. See FC301 for a listing of topics. *Prereq: FC301.*

FC350 Chinese Culture through Film (3-0-3). This course, taught in English, is proposed as a Hum/SS elective and possibly part of the Regional Studies programs at USNA. The rise of Chinese economic, political and military power makes it necessary for American military professionals to learn and understand Chinese society and culture. The course offers an introduction to Chinese society and culture through feature films, documentaries and readings. The course is organized around thematic issues such as geography and history, politics, society, culture, daily life, belief systems, and contemporary problems. Each film will be analyzed from different perspectives, with the help of required contextual readings. Topics discussed in the course include Chinese history in films, film as a cultural form, aspects of Chinese culture and society, the relationship between tradition and modernity, gender politics, and Chinese nationalism in the era of globalization. Knowledge of Chinese language is not required. All the films have English subtitles and are produced by Chinese filmmakers from Mainland China, Taiwan and Hong Kong. Films must be viewed outside the class before the lecture-discussion class hours. Offered in English. *Prereq: HE111 or equivalent.*

FC360 20th-Century Chinese Literature (3-0-3). This course, taught in English, is proposed as a Hum/SS elective and possibly part of the Regional Studies programs at USNA. The rise of Chinese economic, political and military power makes it necessary for American military professionals to learn and understand China from Chinese perspectives. The course offers an introductory study of the twentieth-century Chinese history, society and culture through literature, with a focus on the relationship between the self and modernity in Chinese literature. Midshipmen read literary works such as short stories, plays, poems, and novels, and view films by Chinese writers and directors in chronological order, as well as historical narratives, biographies, and literary criticism by both Western and Chinese scholars. They discuss issues raised by the readings, and learn to critically interpret and understand twentieth-century Chinese literature and Chinese thought. *Prereq: HE112 or equivalent.*

FC401 Chinese Language and Culture I (3-0-3). This course continues from FC302 to further enhance midshipmen's exposure to Chinese vocabulary, grammar, discourse structure, communicative skills, character reading and writing, as well as their knowledge of Chinese culture. Through a rich variety of topics such as the origin and structure of Chinese characters, homophones and idioms, traditional and simplified characters, the origin of the name of the country, women and marriage, education, birth-control, human rights, religion, myths, and folk tales, midshipmen increase their understanding of China's history and modern life, while gradually moving to comparatively higher levels of proficiency in spoken and written Chinese. *Prereq: FC302 or equivalent.*

FC402 Chinese Language and Culture II (3-0-3). This course continues from FC401 to further enhance midshipmen's exposure to Chinese vocabulary, grammar, discourse structure, communicative skills, character reading and writing, as well as their knowledge of Chinese culture. Through a rich variety of topics such as the origin and structure of Chinese characters, homophones and idioms, traditional and simplified characters, the origin of the name of the country, women and marriage, education, birth-control, human rights, religion, myths, and folk tales, midshipmen increase their understanding of China's history and modern life, while gradually moving to comparatively higher levels of proficiency in spoken and written Chinese. *Prereq: FC401 or equivalent.*

FC450 Styles of Discourse in Chinese (3-0-3). This course consolidates knowledge and skills students have acquired through previous Chinese courses. It enhances their reading, writing, and aural-oral abilities through studies of different styles of discourses such as stories, advertisements, public notices, public speeches, letters, and interviews. Building on comprehension and expression at the level of single sentences, emphasis is placed on various discourse organization mechanisms such as narratives with sequential or cause-effect arrangements, descriptions of physical environments and personal emotions, and arguments of positions and opinions in different contexts. *Prereq: FC302 or equivalent.*

FC460 Chinese in Media (3-0-3). This course develops students' Chinese proficiency at a more advanced level, through work with various forms of Chinese media, including newspaper reports, internet news, TV excerpts and other audio-visual materials. Students expand their vocabulary, enrich their knowledge of grammatical structures and idiomatic expressions, gain greater exposure to written-style Chinese, and increase their comprehension and production of narration, description, and argumentation in both speaking and writing. *Prereq: FC401 or FC450 or equivalent.*

French Courses

FF101 Basic French I (3-0-3). Develops basic communicative skills, with an emphasis on speaking and listening comprehension. *Prereq: none.*

FF102 Basic French II (3-0-3). Develops basic communicative skills, with an emphasis on speaking and listening comprehension. *Prereq: FF101.*

FF201 Intermediate French I (3-0-3). Continues development of oral, reading, and writing skills using real-life situations. Emphasizes practical, everyday culture of French-speaking world. *Prereq: FF102.*

FF202 Intermediate French II (3-0-3). Continues development of oral, reading, and writing skills using real-life situations. Emphasizes practical, everyday culture of French-speaking world. *Prereq: FF201.*

FF301 Advanced French with Civilization Readings I (3-0-3). Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of French civilization. Taught in French. *Prereq: FF202.*

FF302 Advanced French with Civilization Readings II (3-0-3). Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of Francophone literature and culture. Taught in French. *Prereq: FF202.*

FF411 Development of French Civilization (3-0-3). From the origins to World War II. *Prereq: FF302 or approval of department chair.*

FF412 Modern France (3-0-3). All aspects of contemporary France: geography, economy, institutions, society, politics and culture. *Prereq: FF302 or approval of department chair.*

FF421 Representative Readings in French Literature I (3-0-3). Class discussions of works by leading writers of various periods. Program includes film versions of several titles. Taught in French. *Prereq: FF302 or approval of department chair.*

FF422 Representative Readings in French Literature II (3-0-3). Class discussions of works by leading writers of various periods. Program includes film versions of several titles. Taught in French. *Prereq: FF302 or approval of department chair.*

German Courses

FG101 Basic German I (3-0-3). A beginning course designed to develop communication skills by exposing the student to authentic spoken and written German from the first day of class. The course, aside from stimulating interest in German culture and tradition through authentic materials, prepares the student to cope with real language situations effectively. Equal emphasis is placed on receptive and productive language skills, as well as communication strategies. Course materials include computer software, video segments and authentic film clips. *Prereq: none.*

FG102 Basic German II (3-0-3). Emphasizes the spoken language. *Prereq: FG 101.*

FG201 Intermediate German I (3-0-3). Continuation of FG101. Intermediate German sharpens the students' spoken and written communicative skills while fostering grammatical competence and providing insights into the social, cultural and political realities of the contemporary German-speaking world through multi-media, on-line and print materials. Classroom activities emphasize the personalized creative use of German in a range of student-centered situations and contexts, including role-playing, debates, and oral reports on cultural topics and current events. *Prereq: FG102.*

FG202 Intermediate German II (3-0-3). Continues development of oral, reading and writing skills. Includes area and cultural topics. *Prereq: FG201.*

FG310 Introduction to Contemporary Germany (3-0-3). An introduction to the geography and political, economic and social systems of the Republic of Germany, in German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG320 Introduction to German Literature (3-0-3). In German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG411 Development of German Civilization (3-0-3). Contemporary German society, institutions and national policies. *Prereq: FG310 or approval of department chair.*

FG412 Modern Germany (3-0-3). Reviews main currents of postwar German political history, culture and society. *Prereq: FG310, FG320 or approval of department chair.*

FG421 Representative Readings in German Literature I (3-0-3). Analysis and discussion of works of leading writers of various periods. *Prereq: FG320 or approval of department chair.*

FG422 Representative Readings in German Literature II (3-0-3). Analysis and discussion of works of leading writers of various periods. *Prereq: FG320 or approval of department chair.*

Japanese Courses

FJ101 Basic Japanese I (3-0-3). Beginning Japanese I introduces the contemporary spoken and written Japanese. Emphasis is on developing basic communication skills in listening, speaking, reading and writings. All Kana letters and some Kanji characters are introduced. *Prereq: none.*

FJ102 Basic Japanese II (3-0-3) Beginning Japanese II introduces the contemporary spoken and written Japanese. Emphasis is on developing basic communication skills in listening, speaking, reading and writings. All Kana letters and some Kanji characters are introduced. *Prereq: FJ101.*

FJ201 Intermediate Japanese I (3-0-3). Intermediate Japanese I aims at further development of communication skills in spoken and written Japanese. More Kanji characters are introduced to prepare students to read authentic written materials such as memos, advertisements, and letters. *Prereq: FJ102.*

FJ202 Intermediate Japanese II (3-0-3). Intermediate Japanese II continues development of communication skills in spoken and written Japanese. Instructions and course materials are presented in Japanese. *Prereq: FJ201.*

FJ301 Advanced Japanese I (3-0-3). Advanced Japanese I introduces more sophisticated vocabulary and more complex sentence structures required for effective interpersonal communication and interpretation of written texts. *Prereq: FJ202.*

FJ302 Advanced Japanese II (3-0-3). Advanced Japanese II aims at further development of communication skills. Emphasis is on inculcating knowledge of and sensitivity to the cultural and social context of the language use. *Prereq: FJ301.*

FJ412 Advanced Japanese Conversation (3-0-3). This course aims at further development of communication skills, particularly in listening and speaking. Reading and writing skills are integrated to reinforce the development of listening and speaking skills. Goals include: 1) expression of the student;s own ideas on selected topics in a coherent and cohesive manner, 2) listening for information (to take notes, 3) improving practical ability to read and present extracted information in Japanese. Class will be conducted in Japanese. *Prereq: FJ202 or approval of department chair.*

Language Courses

FL220 Language and Linguistics (3-0-3). Explores the nature and structure of language, including the study of sound systems (phonetics and phonology), patterns of word formation, syntax, semantics, and pragmatics (meaning in social context). Other topics include cross-cultural differences, language and social identity, the nature of textuality and writing, language processing, and first and second language acquisition. *Prereq: HE112.*

FL301 Intercultural Communication (3-0-3). This course explores how different cultures filter experience through their unique views of institutions, conventions, time and space. As military professionals encounter problems in international interaction, communicating effectively with people of different cultural and ethnic backgrounds needs to be a part of their preparation. The goal of this course is to increase cultural awareness and competency and to teach communication skills that can be used in all languages when encountering foreign cultures. Included in this course are readings in intercultural theories such as cultural value dimensions (Hofstedt) and cultural context dimensions (Hall & Hall). Students will study the concept of cross-cultural competency and communication by utilizing a hands-on approach. Throughout the semester, students will be involved in presentations, simulation and role-playing exercises, demonstrations using various forms of media and interactions with people from a variety of cultures including Japan, Russia, the Middle East and the American deaf community. Students are assigned to complete an intercultural partner project which involves the development of a relationship with a person from a culture other than their own. As a hum/ss elective, this course is designed to benefit students in any major offered at USNA. *Prereq: HE111.*

Russian Courses

FR101 Basic Russian I (3-0-3). The first of a two course introduction to Russian culture and daily life through the use of communicative approaches to language, with emphasis on listening comprehension and speaking. The courses develop basic reading and writing skills, and provide insights into contemporary society and behavioral norms. If taken and passed at USNA, may be used as a free elective by Division I and II majors. *Prereq: none.*

FR102 Basic Russian II (3-0-3). A continuation of FR101. If taken and passed, may be used in place of a 200 level humanities-social science elective by Division I and II majors. *Prereq: FR101.*

FR201 Intermediate Russian I (3-0-3). Continues development of oral, reading and writing skills with the emphasis on spoken Russian. Includes area and cultural topics. *Prereq: FR102.*

FR202 Intermediate Russian II (3-0-3). Continues development of oral, reading and writing skills with the emphasis on spoken Russian. Includes area and cultural topics. *Prereq: FR201.*

FR330 Advanced Russian with Civilization Readings I (3-0-3). Further development of communicative skills in Russian. Emphasizes listening, speaking and reading. Knowledge of main socio-cultural periods from 9th through 20th centuries. *Prereq: FR202.*

FR340 Advanced Russian with Civilization Readings II (3-0-3). Further development of communicative skills in Russian. Emphasizes listening, speaking and reading. Knowledge of main socio-cultural periods from 9th through 20th centuries. *Prereq: FR202.*

FR350 Russian Literature and Culture in Translation (3-0-3). This course uses English translations of classic Russian Texts which impact the way Russians behave and think about themselves today. Through Russian literature, music and film, students gain deep insights into Russian culture. Counts as an upper level humanities-social science course. *Prereq: none.*

FR411 Development of Russian Civilization (3-0-3). From the 10th century to World War II. *Prereq: FR340 or approval of department chair.*

FR412 Modern Russia (3-0-3). The Soviet Union since World War II; social, cultural, economic patterns; technology, armed forces; national policies. *Prereq: FR340 or approval of department chair.*

Spanish Courses

FS103 Basic Spanish I (3-0-3). The first of a two-course sequence emphasizing the development of listening and speaking skills in the context of grammar review and with a focus on sophisticated verbal constructions. Both semesters underscore exposure to real cultural materials (readings, video, Internet). The course also incorporates episodes from the video series Destinos. *Prereq: One year of senior high school Spanish or permission of department chair.*

FS104 Basic Spanish II (3-0-3). The continuation of the two-course sequence FS103-104 emphasizing the development of listening and speaking skills in the context of grammar review and with a focus on sophisticated verbal constructions. Emphasis is placed on vocabulary building, narration in the past, acquisition of idiomatic constructions, and advanced sentence structures requiring the subjunctive. Both semesters underscore exposure to real cultural materials (readings, video, Internet). The course also incorporates episodes from the video series "Destinos." *Prereq: FS103.*

FS201 Intermediate Spanish I (3-0-3). Intermediate Spanish I continues the development of all four language skills–speaking, listening comprehension, reading and writing–begun in Basic Spanish. Emphasizes expansion of both active and passive vocabulary, use of more complex language structures and the development of cultural literacy. Taught in Spanish. *Prereq: FS104.*

FS202 Intermediate Spanish II (3-0-3). Intermediate Spanish II continues the development of all four language skills–speaking, listening comprehension, reading and writing–begun in Intermediate Spanish I. Emphasizes expansion of both active and passive vocabulary, use of more complex language structures and the development of cultural literacy. Taught in Spanish. *Prereq: FS201.*

FS301 Advanced Spanish with Readings on Contemporary Spain (3-0-3). Develops linguistic proficiency in speaking and writing with readings and videos on contemporary Spanish-American culture. Includes grammar reviews, internet searches, computer-based materials, newspaper articles and literary selections that address current issues involving Spanish-speaking nations in this hemisphere. *Prereq: FS202.*

FS304 Advanced Spanish with Readings on Contemporary Spain (3-0-3). Develops linguistic proficiency in speaking and writing with readings and videos on contemporary Spain. Includes grammar reviews, Internet searches, computer-based materials, newspaper articles and literary selections that address current issues in Spain since Franco. Also includes naval terminology. *Prereq: FS202.*

FS412 Contemporary Latin American Civilization (3-0-3). Past and current social, economic, cultural and political patterns and problems. *Prereq: FS304 or approval of department chair.*

FS413 Spanish Civilization (3-0-3). Culture and civilization of Spain from the Roman period through the 20th century supplemented by videos, readings and classroom discussion. *Prereq: FS304 or approval of department chair.*

FS421 Spanish Literature (3-0-3). Representative works such as *The Cid* and *Don Quixote* reflecting the culture, ethics and values of Spain in its major literary periods. *Prereq: FS304 or approval of department chair.*

FS422 Spanish American Literature (3-0-3). Novels, stories, essays, poetry and plays reflecting the culture, ethics and values of major Spanish American countries from the colonial era to the present. *Prereq: FS304 or approval of department chair.*

Other Language Courses

FX101 English for Non-Native Speakers I (3-0-3). Alternative to common plebe year courses HE111. Emphasizes writing, American culture and values. *Prereq: approval of department chair.*

FX102 English for Non-Native Speakers II (3-0-3). Alternative to common plebe year course HE112. Emphasizes writing, American culture and values. *Prereq: FX101.*

Political Science Department

Political Science Major

The political science major is designed to provide prospective naval officers with an understanding of the structure and functions of domestic and international political systems within a framework of political analysis. The wide-ranging, interdisciplinary program develops political science skills sequentially by first requiring foundation courses in international relations and United States government, emphasizing familiarity with the Constitution each midshipman has sworn to defend.

Upper-level courses offer the opportunity to explore law, political theory, institutional and policy analysis and area studies of the United States, Europe, the former Soviet Union, Latin America and Asia. The major is enhanced with courses in foreign languages. Summer internship programs in Washington and overseas and the possibility of graduate work in intelligence or national security affairs expand educational opportunities.

Each spring the political science department and the Division of Humanities and Social Sciences sponsor the Naval Academy Foreign Affairs Conference (NAFAC), which is run by midshipmen. NAFAC has become one of the foremost undergraduate conferences in the country, drawing professors and students from more than 140 colleges and universities in the U.S. and abroad, in addition to senior diplomats, military leaders and journalists. In addition to NAFAC, an active Model United Nations Club conducts a high school conference and participates in several college-level conferences around the country.

A bachelor of science degree is awarded. An honors program with a designated honors degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM223; plus either SM230 or SM212;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives outside the major including one at the 300/400 level;
Language: Four semesters of a foreign language;
Engineering: EN400, EM300; EE301, EE302, ES300, ES360, and one free elective;
Major: FP210 or FP230, FP220, FP471, and seven major electives.

Political Science Courses

FP130 United States Government and Constitutional Development (3-0-3). Basic concepts of American democracy, the Constitution, political process, structure and functions of national government and factors influencing its operation; emphasis on legal and ethical demands placed on government officials, both civilian and military, as defined by the Constitution and statute. *Prereq: none.*

FP130X United States Government and Constitutional Development (3-0-3). The basic concepts of American democracy and the Constitution placed in a comparative context for midshipmen from foreign countries. *Prereq: This version of FP130 is for foreign nationals.*

FP210 Introduction to International Relations (3-0-3). Approaches to analysis of international relations; nature and evolution of international political systems; foreign policy decision making; roles of non-state actors; diplomacy and war; Third World economic development; and international institutions. *Prereq: FP130.*

FP220 Political Science Methods (3-0-3). A discussion of the philosophy of science for the political scientist; instruction in research methods with emphasis on scientific method and quantitative techniques. *Prereq: FP130.*

FP230 Introduction to Comparative Politics (3-0-3). Introduces midshipmen to the study of politics in other societies. A course in comparative politics offers students a basic framework for analyzing other political systems. Key theoretical concepts, analytical tools and seminal works in the field are introduced to lay the foundation for advanced area studies coursework. *Prereq: FP130.*

FP310 Introduction to Global Strategic Studies (3-0-3). Examination of the global international system from the strategic perspective to enhance our understanding of the processes and dynamics of global changes and their impact on professional careers in the naval service. *Prereq: FP130.*

FP311 Ethics and International Relations (3-0-3). At the outset, the focus is on a study of the dominant theories of international relations, particularly Bismarkian realism and Wilsonian idealism. Then, using historical and fictional cases, passages from literature, and guest speakers, this course explores case studies that illustrate the ethical dilemmas that arise in the relations between states. By contrast with courses that treat ethical issues for an individual, this course deals with the acts of states and of other groups such as insurgency movements, non-governmental organizations, and international affiliations. *Prereq: FP130.*

FP313 Information Technology and International Politics (3-0-3). Effects of information technology on both the national and international political systems; emphasis on changed weaponry, the vulnerability of cyberspace and other aspects of the information revolution on the relations among nations. *Prereq: FP210.*

FP314 Formulation of U.S. Foreign Policy (3-0-3). Case study-based review of the content, formulation and execution of U.S. foreign policies since World War II, including decision-making processes, administration of policy and development of current policies. *Prereq: FP130.*

FP322 Comparative European Politics (3-0-3). Study of foreign and domestic policy issues and processes of major European political systems as well as NATO, the European Union, and the U.S.-European relationship. *Prereq: FP130.*

FP323 Comparative Latin American Politics (3-0-3). Social, economic and political environments; regimes and government institutions and interest groups, political parties, students, church and armed forces; theories of Latin American political behavior with country case studies. *Prereq: FP130.*

FP324 Latin American International Politics (3-0-3). Latin American international subsystem; foreign policy making of Latin American states, United States, Europe, Japan and others; roles of non-state actors; international institutions; diplomacy and violence; and application of international theory. *Prereq: FP130.*

FP325 American Political Philosophy (3-0-3). The theories and practices of Jefferson, Madison, Lincoln, Calhoun, Martin Luther King and other seminal American political thinkers; special emphasis on societal progress and public policy ambiguity under the banner of Liberty and Equality. *Prereq: FP130.*

FP326 American Presidency (3-0-3). An examination of the presidential selection process and of the nature of presidential power in both the domestic and international spheres, with a focus on the ways in which they are both enhanced and constrained by other actors in the political system, including Congress, the judicial branch, the bureaucracy, the media, and the public. *Prereq: FP130.*

FP328 Legislative Process (3-0-3). Decision making in the U.S. Congress; constituencies and elections, role of party and committees, and interaction with executive and judicial branches, bureaucracy, interest groups and other actors. *Prereq: FP130.*

FP335 Non-Democratic Politics (3-0-3). Examination of modern totalitarian and authoritarian regimes as distinct forms of political organization. *Prereq: FP130.*

FP340 Modern Political Thought and Ideology (3-0-3). Introduces students to the main componenets of contemporary political ideas and principles. The course distinguishes among philosophical arguments, ideological convictions, and social movements. It emphasizes that during the twentieth century this distinction has blurred, resulting in highly popularized ideology disguised as philosophy. During this course, important concerns about basic political values, the nature of justice and the distribution of wealth along with central concepts like equality, liberty, and rights are considered in light of topical issues. Though a logical sequel to the required FP430 (Political Philosophy) course, this course is open to any student interested in exploring contemporary political arguments and proposals. Readings range from the extremes of anarchism to debates about feminism and environmentalism. *Prereq: FP130.*

FP341 Political Psychology (3-0-3). Introduction to psychological concepts and approaches used to analyze politics. Topics covered include acquisition of personal political attitudes and beliefs; the dynamics of public opinion; theories underlying PsyOp (Psychological Operations), riots, revolutions and wars; and psychological sources of effective and defective decisions in small group settings such as juries, military commands and policy settings. *Prereq: FP130.*

FP345 Environmental Politics and Security (3-0-3). This course examines the major environmental problems currently influencing U.S. domestic and environmental security policies. It explores major theories about the relationships among environmental, demographic, and political conflicts and provides a broad overview of what is known and still unknown. Public policy controversies related to global warming, pollution, degradation and future scarcity of land, air, ocean, fresh water resources and biodiversity are examined in some detail. Enduring and novel ethical issues about how to promote the rights of humans and other species are covered in discussions and debates. Special emphasis is placed on DoD environmental programs and the legal responsibilities and obligations of naval officers in implementing U.S. environmental security policies. Each midshipman will chose a specific environmental security issue and learn to complete a policy evaluation. *Prereq: FP130.*

FP350 Political Economy (3-0-3). This course provides an understanding of the collective action taken by the state and the economy where individuals engage in self-interested behavior. It deals with how the state uses power to make decisions about

who gets what, when and how; and how scarce resources are allocated and distributed through the market process. Topics include: the structure of political economy, state-market tensions, economic nationalism, democracy and capitalism, and international trade and finance. *Prereq: FP210.*

FP355 Civil-Military Relations (3-0-3). An examination of the interplay between civilians and the military in a liberal democratic society. The course blends of theory, practice, policy, sociology, history and political philosophy to examine the relationship of the professional military to the society which it serves. Employs a comparative approach with emphasis on case studies. *Prereq: FP130.*

FP356 Conflict and Peacemaking (3-0-3). This seminar focuses on examining, discussing, and learning how to think critically about the nature of conflicts and the art of peacemaking in the post-Cold War world. It will include lectures, problem-centered learning approaches and discussion sessions. Interactions with experts and a visit to a foreign embassy assist midshipmen in gaining a perspective on conflict management and peacemaking. *Prereq: FP130.*

FP357 Politics of China and Japan (3-0-3). An examination of the Chinese/Japanese political system with emphasis on the dynamic interaction of traditional and Marxist ideological forces. *Prereq: FP130.*

FP358 Politics of Southeast Asia (3-0-3). This course presents a survey of Southeast Asian politics, including Indonesia, Malaysia, Singapore, Thailand, and the Philippines. Democratization, political economy, the role of Islam, maritime piracy, and security issues will be examined. *Prereq: FP130.*

FP360 Middle East International Politics (3-0-3). FP360 addresses central issues pertinent to the Middle East such as the sources of conflict in the region, political and economic factors that promote peace and stability, the role of international organizations, and the role of non-state actors. The course also reviews the region's colonial past along with domestic circumstances that affect the influence of the Middle East on global affairs. A careful look at the Bush Doctrine and the rise of terrorism are included. The course counts as an FPSI elective. *Prereq: FP130 and FP210 (or permission of department chair.)*

FP365 African Politics (3-0-3). Analysis of political trends and constitutional development of African political systems; their relations with one another and outside world; attention directed to U.S. security interests in Africa. *Prereq: FP130.*

FP367 Politics of Russia and the CIS (3-0-3). The development and disintegration of the contemporary Russian political system. *Prereq: FP130 (FP210 highly recommended).*

FP368 Comparative Asian Politics (3-0-3). Systematic comparative approach to the study of political systems in East and Southeast Asia (with country cases selected from the Koreas, Taiwan, Malaysia, Myanmar, Indonesia, Philippines, Singapore, Thailand and Vietnam); theoretical emphasis on ethnic conflict, economic development and democratization. *Prereq: FP130.*

FP369 Middle Eastern Politics (3-0-3). Comparative analysis of domestic politics, political economy, the role of religion, foreign policies, and elements of international relations of Middle Eastern political systems; theoretical emphasis on ethnic conflict, conflict resolution and democratic development. *Prereq: FP130.*

FP370 Foreign Policy of Russia and CIS (3-0-3). Discussion of geopolitical, ideological, institutional, cultural and economic factors affecting foreign policy decision making in Russian and other members of Commonwealth of Independent States; regional and global issues of security, democracy and free market economics. *Prereq: FP130 (FP210 highly recommended).*

FP371 Asian International Politics (3-0-3). Analysis of interstate relations of selected East and Southeast Asian states; concentration on regional organizations, security alliances and bilateral arrangements. *Prereq: FP130.*

FP372 Political Parties, Campaigns and Interest Groups (3-0-3). Study of dynamics of group politics in the U.S. political system; emphasizes roles played by parties, interest groups, public opinion and elections in the U.S. political process. *Prereq: FP130.*

FP375 Politics and the Media (3-0-3) A comprehensive analysis of how print, electronic and computer-based mass media choose, cover and disseminate information about American politics and government. Analysis of contemporary media from the perspective of subjects, disseminators and consumers of the news. *Prereq: FP130.*

FP384 Politics of Irregular Warfare (3-0-3). Theoretical, historical and policy examination of low-level political-military confrontation; viewed from several perspectives, such as revolutionary, policy-making, military and nation-state; focus on U.S. response to LIC. *Prereq: FP130, 2/C.*

FP397 Criminal Law and Justice (3-0-3). An examination of both (1) the criminal justice system and the requirements of due process as mandated by the Constitution (double jeopardy, coerced confessions, plea bargaining, etc.) and (2) the criminal law – the nature of criminal intent, the criminal act, the defenses (self-defense, insanity, etc.) as illustrated in such common law felonies as murder, rape, robbery, and battery. *Prereq: FP130, 2/C.*

FP403 Advanced Research Seminar in Washington (3-0-3). Intensive hands-on introduction to unique research resources of Washington, D.C., such as Library of Congress computer system, Federal Elections Commission Data Base and others; research design, field trips to Washington for data base use and elite interviewing. *Prereq: 1/C FPS major.*

FP407 Intelligence and National Security (3-0-3). Examination of nature, significance and development of intelligence including collection, counterintelligence, clandestine and covert action and evaluation; includes current issues and case studies. *Prereq: FP130, FP210, and 1/C or 2/C standing.*

FP408 International Law (3-0-3). Survey of public law of nations including jurisdiction, citizenship, nationality, human rights, and treaty law. This course places special emphasis on the law of the sea, the law of war, and the legal issues involving the use of force by states. *Prereq: FP210.*

FP413 Constitutional Law: Federal System (3-0-3). An analysis of key Supreme Court decisions interpreting the power of the judiciary, the executive and congress under the Constitution; nation-state relations; the commerce power; economic liberties. *Prereq: FP130.*

FP414 Constitutional Law: Civil Liberties (3-0-3). An analysis of leading Supreme Court decisions in the areas of speech, press, and religion; equal protection of minorities and women; privacy. *Prereq:FP130.*

FP420 Public Policy Analysis (3-0-3). Analysis of U.S. public policy toward social and economic problems, including nature of social choice; survey of selected policy areas, such as health care, education, housing and economic and social welfare. *Prereq: FP130.*

FP421 National Security Policy (3-0-3). Examination of interaction of domestic and foreign political and military considerations in the formulation and execution of national security policy; use of case studies and review of current strategic policies. *Prereq: FP130.*

FP430 Political Philosophy (3-0-3). Study of Western political philosophy, with emphasis on roots of democracy and the meaning of justice; explores relationship between individual and society, as well as the sources of a state's power and authority; examines works of major thinkers from Plato to the present. *Prereq: FP130.*

FP437 International Organizations (3-0-3). International organizations in world politics; attention given to control of conflict and violence, economic cooperation and management of global resources; major focus on the United Nations; discussion of selected regional issues and other organizations. *Prereq: FP130 and FP210.*

FP440 Politics of Central Europe (3-0-3). Analysis of the politics of Central Europe from a comparative prospective; the struggle for national identity and economic development in the post-communist environment. *Prereq: FP130.*

FP450 International Political Economy (3-0-3). This course examines the historical and theoretical foundations of contemporary international political economy. It explores the evolving association between government and economics stressing the roles of mercantilism, liberalism and globalization. It explores the political and economic influence of U.S. national agencies as well as international organizations during the later half of the 20th century. *Prereq: FP210 or instructor permission.*

FP 471 Capstone Seminar (3-0-3). The capstone seminar in Political Science provides a directed research experience designed to pull together key elements of the area of concentration. Midshipmen prepare a comprehensive research paper that demonstrates their mastery of substantive knowledge and competence in applying writing and research skills. *Prereq: 1/C FPS majors only.*

FP480 IT Research Seminar (3-0-3).

FP500 Honors Advanced Research Design (2-0-2). Advanced research techniques: individual design guidance with special reference to advanced statistical techniques as well as methodological approaches. Literature review and presentation to the faculty. *Prereq: FPS 2/C honors students only. Honors Director permission required.*

FP505 Honors Senior Seminar (3-0-3). An advanced research seminar to carry out the research to culminate in a senior honors thesis. *Prereq: FP500, 1/C FPSH major.*

FP510 Honors Senior Thesis (3-2-4). An advanced research seminar allowing students to complete the research that will culminate in their senior honors thesis. *Prereq: 1/C FPSH major.*

Division of Mathematics and Science

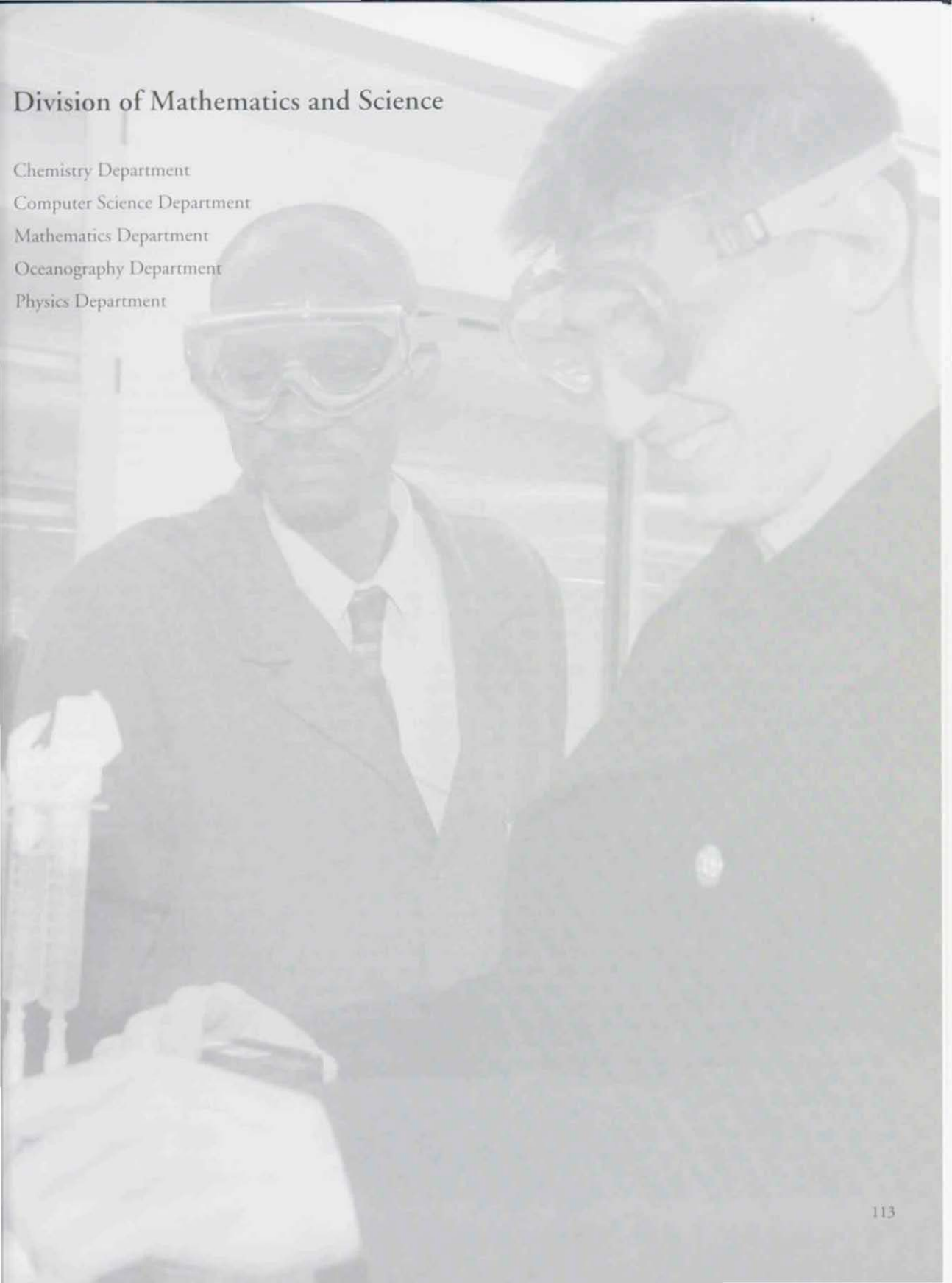
Chemistry Department

Computer Science Department

Mathematics Department

Oceanography Department

Physics Department



Chemistry Department

Chemistry Major

The chemistry major at the Naval Academy provides midshipmen with training in all of the discipline's traditional fields, leading to a bachelor of science degree certified by the American Chemical Society.

All chemistry majors take required courses in organic, inorganic, analytical and physical chemistry and biochemistry. In addition to the required courses, midshipmen may take advanced courses in each of these subject areas along with related areas such as polymer chemistry, explosives and propellants, forensics and environmental chemistry. Senior capstone or research projects enable midshipmen to investigate topics of particular interest to them under the guidance of a faculty member.

Chemistry is an experimental science, and many hours are devoted to laboratory work. The chemistry department at the Naval Academy has one of the finest undergraduate chemistry laboratory facilities in the nation, with modern spaces and a wide array of instrumentation. Skilled technicians maintain the laboratories, assist the faculty and help midshipmen solve practical problems in the labs. Faculty have a wealth of experience, not only in their academic understanding of chemistry but also in the practical application of chemistry in the Navy and Marine Corps. Chemistry majors will find that their civilian and military instructors can make the study of chemistry a highlight of their learning experience at the Naval Academy.

The chemistry major gives midshipmen a solid background in scientific principles required for any of the technical disciplines in which they will work as naval officers. It also provides an excellent academic base for graduate studies in such diverse fields as medicine, oceanography, operations research, management and engineering.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM223, SM212;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives including one at the 300/400 level;
Engineering: EE301, EE302, EA400 or EN400 or EN401, EM300, ES300, ES360;
Major: SC214, SC225, SC226, SC262, SC263, SC335, SC345, SC363, SC356, SC346, SC364, SC476 or SC496, two major electives, SC472, and one free elective.

Chemistry and Biology Courses

Biology Courses

SB201 Biology for the Naval Officer (3-0-3). Students will learn basic biology in the context of its applications to everyday life and their future duties in the Naval Service. Topics include: diet and nutrition, hormones, genetics and the human genome, genetic engineering, DNA "fingerprinting," human performance, disease, resistance and immunity. Note: Students cannot get credit for both SB201 and SB211 or SB201 and SB251. *Prereq: none.*

SB211 Biology for the Naval Officer with Lab (3-2-4). Students will learn basic biology in the context of its applications to everyday life and their future duties in the Naval Service. Topics include: diet and nutrition, hormones, genetics and the human genome, genetic engineering, DNA "fingerprinting," human performance, disease, resistance and immunity. Laboratories are designed to reinforce and expand upon topics from lecture. Note: Students cannot get credit for both SB201 and SB211 or SB211 and SB251. *Prereq: none.*

SB251 General Biology I (3-2-4). Fundamental principles of the science of biology are introduced. Topics include metabolism, cell structure and function, classical and molecular genetics, evolution and ecology. The perspective of the course is from life as a whole, with a focus on the position of humans in the overall scheme. *Prereq: none.*

SB252 General Biology II (3-2-4). This course provides students with a solid foundation in human physiology. Lectures focus on the mechanisms of body function along with complementary concepts in biochemistry, cell biology, genetics, and developmental biology. Laboratory sessions cover the same topics as well as anatomy and histology. *Prereq: SB251.*

SB338 Molecular and General Genetics 3-0-3. Students in this course will study the inheritance of traits, starting with basic (Mendelian) genetics and ending with modern molecular biology. The course will examine incomplete dominance, epistasis, pleiotropy, transformation, cloning, genetic engineering, imprinting, and experimental techniques. Colisted as SC338. *Prereq: SB251 or SC335.*

SB341 Advanced Physiology 3-0-3. The molecular mechanisms and genetics of normal physiological regulation as well as the physiology of some common pathological states such as heart disease and kidney failure will be investigated. The major body systems, including cardiovascular, pulmonary, renal, reproductive, and digestive, along with their control by the nervous and endocrine systems are studied. *Prereq: SB252.*

SB421 Developmental Biology (2-2-3). Students in this course will learn about animal development from fertilization through adolescence, focusing on vertebrate development, especially that of humans. In lecture, the molecular and genetic control of development will be emphasized, whereas in laboratory sessions embryology and developmental anatomy will be studied with extensive microscopy. *Prereq: SB211 or SB251.*

SB431 Microbial Chemistry (2-2-3). This course will explore the interesting and important interactions that occur between microbes and their surroundings, including human hosts and extreme environments. Species of these "simple" organisms have evolved diverse mechanisms to combat assault by antibiotics, heavy metals, pollutants and extreme irradiation. The lab component of the class will include identifying, cultivating and testing organisms with survival mechanisms of interest. Colisted as SC431. *Prereq: SB251 and SC335.*

Chemistry Courses

SC111 Foundations of Chemistry I (3-2-4). The first in a two-semester sequence presenting the fundamental laws and theories of chemistry. Major topics include chemical stoichiometry, periodic trends, atomic structure, chemical equilibrium, thermodynamics, nuclear chemistry, electrochemistry and kinetics. The lecture material is complemented with experiments designed to develop the student's laboratory skills. Naval applications of chemistry are introduced throughout the courses to provide an awareness of chemistry in normal Navy operations. *Prereq: none.*

SC112 Foundations of Chemistry II (3-2-4). This is the second in the two-course foundations of chemistry sequence. See SC111 for a general course description. In this version of SC112, naval applications of chemistry including body armor, corrosion, nuclear power, boiler water quality, aircraft deicing, and scuba diving will be emphasized. *Prereq: SC111.*

SC151 Modern Chemistry (3-2-4). A one-semester course for the well-prepared student, satisfying the plebe year chemistry requirement. Students entering this course must have demonstrated their understanding of fundamental chemical concepts by a strong performance on the chemistry validation exam. *Prereq: Placement by department chair.*

SC214 Analytical Chemistry (2-0-2). This course explores the theory and application of "wet" chemical methods and instrumentation in determining the chemical composition and structure of matter. Both qualitative and quantitative aspects of chemical analysis will be addressed. The theories and techniques learned in this course can be used in all branches of chemistry and will be applied in subsequent chemistry courses in the chemistry major. *Prereq: SC225.*

SC221 Chemistry in Modern Warfare (3-0-3). This course will examine the science behind conventional weapons and weapons of mass destruction. The course will begin by examining high explosives and propellants by studying the structure, synthesis, and properties of these materials. The second part of the course will focus on chemical and biological agents to include history, structure, modes of action, detection, protective measures, and methods of decontamination. *Prereq: SC112.*

SC225 Organic Chemistry I (3-0-3). The first of a two-semester sequence of courses focused on the chemistry of covalent compounds of carbon, the "molecules of life." Many important concepts from general chemistry (stoichiometry, bonding, structure, kinetics and thermodynamics) are used and expanded upon. New concepts include conformational analysis, stereochemistry, reaction mechanisms, and molecular orbital theory. *Prereq: SC112 or SC151; Coreq: SC263.*

SC226 Organic Chemistry II (3-0-3). This is the second in the two-course sequence in organic chemistry. See SC225 for a course description. *Prereq: SC225 and SC263; Coreq: SC262.*

SC262 Integrated Laboratory II - Reactions, Chemical and Instrumental Analysis (0-6-2). Qualitative and quantitative methods are applied in the determination of the products of several important chemical reactions, including a multistep synthesis. Students also apply these methods in the analysis of simple equilibrium systems and the separation and identification of a two-component unknown. *Prereq: SC225 and SC263; Coreq: SC226.*

SC263 Integrated Laboratory I - Reactions, Separation and Purification (0-6-2). This laboratory course emphasizes the theory and practice of separating and purifying chemical substances. Techniques include crystallization, distillation, column chromatography, gas chromotography, high performance liquid chromotography, extraction and sublimation. Identification of chemical substances based on infrared and nuclear magnetic resonance spectroscopy are introduced. *Prereq: SC112 or SC151; Coreq: SC225.*

SC311 Marine and Atmospheric Chemistry (3-0-3). An introduction to chemical processes that influence the chemistry of marine waters and the atmospheric marine boundary layer. The course will begin with the composition of seawater and progress towards an understanding of the biogeochemical cycles of important elements in oceanic systems, including the chemistry of tropo-

spheric ozone and aerosol formation. The impact these process have on current and future Naval operations will be discussed. *Prereq: SC112.*

SC325 Advanced Organic Chemistry (3-0-3). Building on the foundation of SC225-226, this course will apply fundamental topics such as stereochemistry, conformation, structure / bonding and mechanisms to advanced topics such as pericyclic reactions, heterocyclic compounds, and the relationship between structure and function of biochemically important organic compounds. *Prereq: SC226.*

SC335 Biochemistry (3-0-3). The chemical basis of life will be examined by studying the relationship between the structure and function of biological macromolecules with an emphasis on proteins and nucleic acids. Metabolic processes involved in energy production, storage and transformation will be studied. Biochemical signaling and biological membranes will also be covered. There will be an overview of modern biochemical experimental methods. *Prereq: SC226.*

SC336 Biochemistry II (3-0-3). This course will expand and build on topics from SC335, such as biomolecular structure, bioenergetics and enzyme kinetics, to cover biosynthesis of amino acids, nucleotides and cofactors; photosynthesis and plant metabolic cycles; signal transduction; molecular genetics; regulation of eukaryotic and prokaryotic gene expression. *Prereq: SC335.*

SC338 Molecular and General Genetics (3-0-3). Students in this course will study the inheritance of traits, starting with basic (Mendelian) genetics and ending with modern molecular biology. The course will examine incomplete dominance, epistasis, pleiotropy, transformation, cloning, genetic engineering, imprinting, and experimental techniques. Colisted as SB338. *Prereq: SB251 or SC335.*

SC341 Introduction to Chemical Engineering Processes (3-0-3). An introductory course designed to prepare students to be able to solve material and energy balances relative to chemical processes utilizing the engineering approach for problem solving. *Prereq: SC112, SP212, SM221.*

SC345 Physical Chemistry I (3-0-3). This course explores physical and chemical phenomena with emphasis on thermodynamics. An introduction to kinetics is included. *Prereq: (SC112 or SC151); and SP211 and SM212.*

SC346 Physical Chemistry II (3-0-3). A continuation of SC345, with an emphasis on the quantum theory of atomic and molecular structure, including spectroscopy. *Prereq: SC345.*

SC351 Chemical Structure Determination by X-ray Diffraction (2-2-3). X-ray diffraction is the most powerful tool for determining the three-dimensional structures of molecules. This course is a practical, hands-on, introduction to modern methods of 3D molecular structure determination by X-ray diffraction. Students will learn the basics of the technique from crystal growth to final structure solution. *Prereq: SC112 and SM212.*

SC356 Inorganic Chemistry (4-0-4). The chemistry of the Main Group elements and the transition metals are studied with emphasis on the properties, structures, and reactivities of these elements and their compounds. *Prereq: SC226 and SC345.*

SC363 Integrated Laboratory III - Physical Principles and Quantitative Analysis (2-6-4). Lecture and laboratory focus on the theory and behavior of molecules and ions in solution. These are explored in the laboratory by classical (volumetric, gravimetric, titrimetric) and modern instrumental (spectroscopic, electrochemical, thermal) methods of analysis. Quantitative laboratory technique is stressed and sampling techniques and statistical analysis of data are introduced. Students apply these techniques in a laboratory analysis of their own design. *Prereq: SC214 and SC262; Coreq: SC345 unless waived by department chair.*

SC364 Integrated Laboratory IV - Advanced Laboratory and Seminar (1-6-3). This laboratory course emphasizes the theory, structure, synthesis and characterization of inorganic and organometallic compounds through application of a number of advanced techniques. Advanced synthetic methods include photochemical, high temperature and inert-atmosphere reactions. Advanced analytical methods include magnetic susceptibility measurements, EPR, Raman and high-resolution, gas-phase spectroscopy and fast reaction (stopped-flow) kinetics. In addition, a weekly seminar that includes discussions and presentations by faculty, students and distinguished visitors provides exposure to the wide-ranging scope of chemistry. *Prereq: SC363; Coreq: SC346 and SC356 unless waived by department chair.*

SC412 Environmental Chemistry (3-0-3). Many analytical chemistry techniques can be used to learn more about the chemistry of our environment. In this course students will be exposed to specific applications of these techniques to various environmental systems (i.e. water, air, soil, etc.). Topics to be explored may include the bio- and geochemical cycles, the effect of military activities on the environment and the use of "green chemistry" in industry. *Prereq: SC214 or SC262 or permission of the department chair.*

SC416 Analytical Chemistry in Forensics (3-0-3). This course will address the types of sample collection techniques used in criminal investigations, as well as the chemical and instrumental methods used to determine the presence of substances associated with illicit activities. Emphasis will be placed on specific forensic investigative techniques such as DNA fingerprinting, drug detection, arson investigations (petroleum residues), bombings (explosives residues) and characterization of fibers and paint. *Prereq: SC363.*

SC421 Introduction to Polymer Chemistry (2-2-3). The synthesis, characterization and physical chemistry of macromolecules, both man-made and natural, will be presented with the ultimate goal of understanding the relationship between molecular structure and physical properties. Polymer processing, fabrication and recent novel applications, including those related to the Navy, will be presented. Field trips to local polymer research and manufacturing facilities are planned. *Prereq: SC226, SC214 and SC262.*

SC425 Medicinal Chemistry (2-2-3). This course will provide a foundation in how pharmacologically active compounds (drugs) work, explore various classes of pharmaceuticals and how they are discovered and review some of the state-of-the-art research being carried out by the military to maximize combat effectiveness. Selected topics will be explored in the laboratory. *Prereq: SC226 and SC335.*

SC431 Microbial Chemistry (2-2-3). This course will explore the interactions that occur between microbes and their surroundings, including human hosts and extreme environments. Species of these "simple" organisms have evolved diverse mechanisms to combat assault by antibiotics, heavy metals, pollutants and extreme irradiation. The lab component of the class will include identifying, cultivating and testing organisms with survival mechanisms of interest. Colisted as SB431. *Prereq: SB251 and SC335.*

SC435 Biophysical Chemistry (3-0-3). Phenomena such as ligand binding, protein and nucleic acid folding and structure, biomolecular motion, and membrane structure and function will be studied by examining the intermolecular forces, kinetics and thermodynamics that govern them. Relevant experimental techniques will also be discussed. *Prereq: SC335 and SC345.*

SC442 Propellants and Explosives (2-2-3). This course will delve into the structural, physical, and chemical properties of energetic materials. Students will investigate the application of energetic materials to military and civilian uses and will explore methods and processes to detect and characterize energetic materials both before and after use. Laboratory experiments investigating energetic materials and their applications are planned. *Prereq: SC226, SC345.*

SC446 Quantum Chemistry (3-0-3). The principles of quantum mechanics are reviewed and used to develop molecular orbital theory which is applied to the structure and properties of molecules. Modern quantum chemistry software will be used for electronic structure calculations. *Prereq: SC346.*

SC451 Bioinorganic Chemistry (3-0-3). Life is inorganic, too. Every breath uses the iron protein, hemoglobin, and every step is supported by bone made of calcium salts and driven by phosphate containing molecules such as ATP. This course will shed light on the structure and function of these bioinorganic compounds using a host of techniques such as X-ray diffraction and NMR spectroscopy. *Prereq: SC335 and SC356 or permission of department chair.*

SC472 Chemistry Seminar (1-0-1). 1/C Chemistry majors meet weekly to discuss ongoing research projects. Each student pursuing a research project will be expected to make a seminar presentation. Other seminar speakers may include department faculty members and researchers from outside the Academy. *Prereq: 1/C SCH major.*

SC476 Capstone Project (0-6-3). Under the guidance of a faculty member, students in this course undertake projects that require them to bring together and apply multiple aspects of their chemistry education. Oral and written progress reports are required at the end of the semester. *Prereq: 1/C SCH major.*

Computer Science Department

Computer Science Major

The Computer Science major gives students a strong foundation in the main areas of computer science leading to a Bachelor of Science in Computer Science.

The nationally recognized Computer Science program at the Naval Academy provides an exciting and challenging curriculum that meets the needs of newly appointed naval officers serving in the fleet's operational forces. The program includes core courses in programming, data structures, computer organization, and networks, as well as courses focused on program performance and efficiency, programming languages, or applications such as artificial intelligence, graphics, and robotics. The computer science curriculum prepares midshipmen with strong theoretical and practical foundations, affording students the flexibility to explore topics ranging from the classical to the cutting edge. The computer science program concludes with a capstone project allowing midshipmen to pursue a topic of their choosing for further, detailed scholarship and research.

The Computer Science program is accredited by the Computing Accreditation Commission (CAC) of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone 410-347-7700.

The Computer Science Department has eight computing laboratories. Three are general purpose labs housing small form factor desktop PCs. Two labs are equipped with workstations with dual-boot capability, supporting both Windows and UNIX operating system environments. Two labs support courses in Information Assurance and Networking, and are configured with isolated networks that allow midshipmen to explore and experiment with network security. A Robotics Laboratory contains manipulator arms, vision systems, desktop computers and mobile robots used for a variety of hands-on projects.

Today's Navy and Marine Corps require junior officers with the highest levels of technical expertise and professional competence. The computer science major will be well equipped to meet the challenges created by rapidly evolving computer technologies.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NN200, NS300, NL310, NL400, NS42X;
Mathematics: SM223, SM242;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives including one at the 300/400 level;
Engineering: EE301, EE303, EM300, ES300, ES360, EA/N4XY and a free elective;
Major: IC210, IC211, IC220, IC221, IC312, IC322, SI340, SI335, SI336, SI413, IC480, and three major electives.

Computer Science Courses

IC210 Introduction to Computing (3-2-4). Introduction to algorithmic development, problem solving and software design. Principles and concepts to provide foundational knowledge and experience upon which later computing courses will build. This is the first course for computer science and information technology majors. *Prereq: none.*

IC211 Object Oriented Programming (2-2-3). This course builds on the procedural programming skills developed in the prerequisite course and introduces the student to object oriented programming and design principles using Java. Object oriented topics such as classes, inheritance, information hiding, polymorphism and dynamic binding are presented and used to create robust, reusable, and maintainable software. The fundamentals of Java are presented along with exception handling, I/O, event driven programming, simple GUIs and generics. *Prereq: IC210 or SI204.*

IC220 Computer Architecture and Organization (3-0-3). This course introduces students to performance metrics, instruction set architectures, assembly language, logic design, memory hierarchies, and pipelining. *Prereq: IC210 or SI204 or permission of department chair.*

IC221 Systems Programming (2-2-3). The study of an application's interface with the operating system. The operating system is treated as an information resource, and as a facilitator for information flow between processes, including those executing on separate machines. Topics include: process management, multiprogramming, and the basic concepts necessary to understand the design and operation of computer communication networks. *Prereq: (IC210 or SI 204 or permission of department chair); Coreq: IC220.*

IC312 Data Structures (3-0-3). This course examines abstract data types (ADT), data structures, data representation and information management including storage structures, allocation and collection. ADTs and data structures presented include lists, stacks, queues, trees, heaps, priority queues, maps, dictionaries and graphs. Sorting and searching techniques, hashing and graph algorithm analysis are also covered. *Prereq: (IC211 or permission of department chair); Coreq: SM242.*

IC322 Computer Networks (2-2-3). The course presents the fundamental theoretical concepts, characteristics and principles of computer communications and computer networks, and analyzes and assesses these foundational concepts with respect to network performance and network design. *Prereq: (IC221; Coreq: SM242) or permission of department chair.*

IC480 Research Sminar/Capstone (1-4-3). This is a capstone course that ties together concepts from the information technology and computer science curriculums to solve a practical problem. These team-oriented project solutions will include the requirements gathering, analysis, design and development of a computing system involving a large, multi-layer organization using appropriate information management and computing technologies. *Prereq: SI336 or IT440 or permission of department chair.*

SI200 Information Technology for the Junior Officer (3-2-4). This is a hands-on lab course introducing computer programming and database management. Topics include: web programming using HTML and XHTML, structured and object oriented computer programming using a scripting language (such as JavaScript) or 4th Generation Language (such as Java or C++), and designing, implementing, and querying databases using a Database Management System (such as Access or SQL Server). The course includes a series of Internet computing and programming projects of increasing complexity. No prior knowledge of databases, web programming, or computer programming is assumed. Students may not receive credit for this course and SI250. It may not count as an SCS major elective and is restricted to non-SIT majors. *Prereq: none.*

SI204 Introduction to Computer Science (3-2-4). Introduction to algorithmic development, problem solving and software design. Principles and concepts to provide foundational knowledge and experience upon which later computer science and computer engineering courses will build. *Prereq: none.*

SI221 Data Structures (2-2-3). Data representation and information management. Dynamic memory, recursion, lists, strings, stacks, and queues. Storage structures, allocation and manipulation. *Prereq: SI204.*

SI250 Information Systems for the Junior Officer (2-2-3). The primary emphasis of the course is practical applications of personal computers and the Internet in the fleet/Fleet Marine Force (FMF), with coverage of some special tactical computers as well. Application software is addressed from a junior officer's viewpoint, as an operational unit Branch/Division/Company Officer or as a support staff member. *Prereq: none.*

SI283 Programming for Engineers (1-2-2). An introduction to a structured programming language and its use in implementing algorithms to solve engineering problems. *Prereq: none.*

SI335 Computer Algorithms (3-0-3). Presents techniques for designing and analyzing computer algorithms including divide and conquer, dynamic programming and greedy methods. Introduces classic algorithms for problems such as searching and sorting, graph analysis, file compression and cryptology. *Prereq: IC312 and SI340.*

SI336 Software Engineering (2-2-3). An introduction to the basic principles of software engineering. Structured, object-oriented, and formal approaches are studied, with emphasis on life cycles, object-oriented techniques and team-oriented software development. *Prereq: IC312.*

SI340 Theory of Computing (3-0-3). This course presents the theoretical foundations for computing, including the study of formal languages, finite state machines, pushdown automata, Turing machines and computability. *Prereq: IC210; Coreq: SM242.*

SI411 Operating Systems (3-0-3). The study of the operating system as a resource manager. Topics include: process management, interrupt processing, memory management, deadlock handling, files systems, multiprogramming, multiprocessing, data security and protection. *Prereq: IC221 and IC312.*

SI413 Programming Languages (2-2-3). This course examines basic concepts underlying the design of modern programming languages: types, control structures, abstraction mechanisms, inheritance, concurrency and constructs for programming. This course will include programming assignments in several languages. *Prereq: IC312 and SI340.*

SI420 Artificial Intelligence (3-0-3). A study of the fundamental concepts and techniques in the design and implementation of functionally intelligent machines. Topics include problem-solving using state-space search, game trees, state and plan space planning, and machine learning. *Prereq: SI335.*

SI435 Advanced Software Engineering (2-2-3). This course presents the latest trends in modern techniques and methods for large scale software development activities, such as object oriented programming. The use of CASE tools and group design project is stressed. *Prereq: SI336.*

SI440 Database Organization (3-0-3). Topics include database systems architecture, the various approaches to database organization including relational, hierarchical and network models; normalization and implementation issues. *Prereq: IC312.*

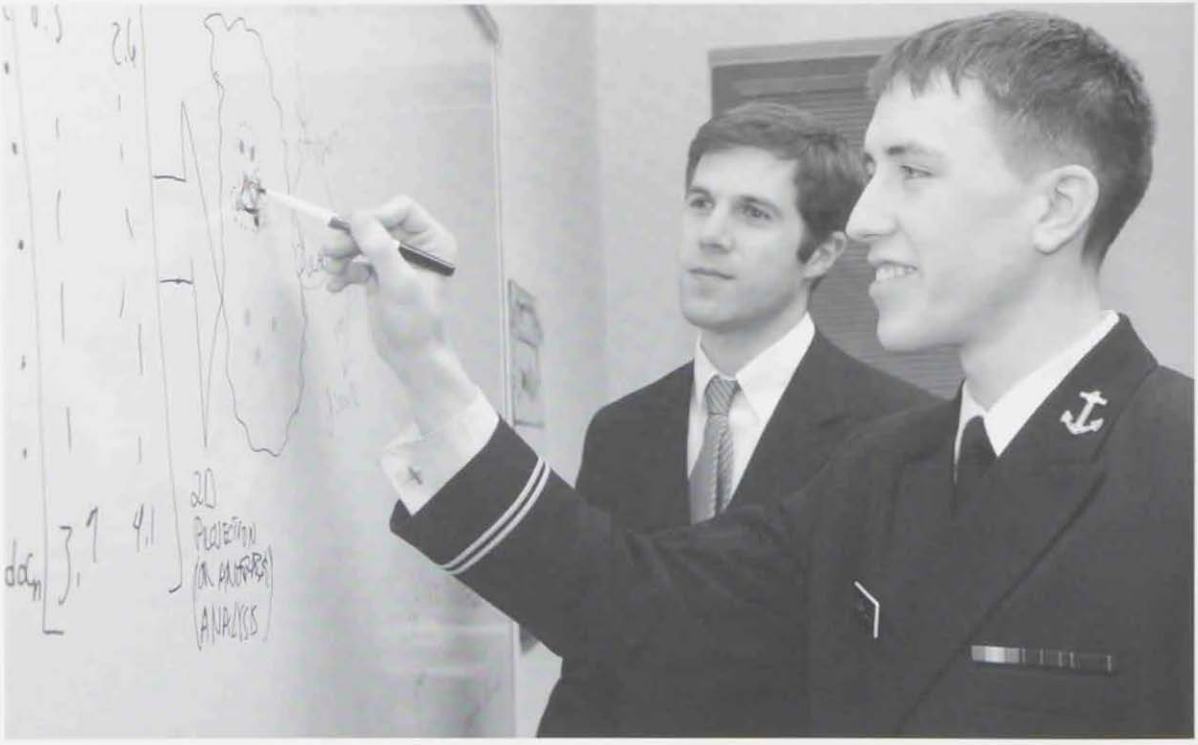
SI452 Advanced Computer Architecture (3-0-3). This course provides an advanced study of the design and evaluation of high performance computer systems. *Prereq: IC220.*

SI455 Advanced Computer Networks (3-0-3). This course provides an in-depth technical study of high-speed networking, client-server programming and applications, network firewall architectures and security procedures, and the ATM network. *Prereq: IC322.*

SI460 Computer Graphics (2-2-3). A project-based course involving basic concepts, theories and algorithms associated with producing 2D and 3D images on a raster display. Topics include graphics primitives, modeling, viewing, illumination, shading, texture, and event-driven programming using a graphics API. *Prereq: IC312.*

SI462 Advanced Computer Graphics (2-2-3). A project-based course involving advanced graphics techniques such as ray-tracing, radiosity, volume rendering, virtual and augmented reality haptics, and pixel shaders. *Prereq: SI460.*

SI475 Intelligent Robotics (2-2-3). Presents the concepts and theories related to computer-driven robotic systems. Students apply acquired knowledge in a laboratory setting be designing, coding, and testing robotics control and sensor systems. *Prereq: IC312.*



Information Technology Major

The Information Technology major prepares midshipmen as critical catalysts for tomorrow's Naval service, serving as leaders in a network centric world and experts in leveraging leading edge technology to solve operational problems. IT majors bridge the gap between technology and its use in the Navy.

The Information Technology program is accredited by the Computing Accreditation Commission (CAC) of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone 410-347-7700.

Students in this program develop a broad base of competencies in software, hardware, and the management of technology. The program begins by providing majors with a strong foundation in the classical computer science core competencies including programming, computer architecture, data structures and software design. The students then focus their studies on internet operations and web applications, information assurance and network security, data management and human-computer interaction. The culmination of their educational experience is a capstone project which brings together all aspects of the students' IT and Naval Academy education and provides a rewarding opportunity for collegial mentorship for both faculty and students. Upon graduation, the majors will be awarded a Bachelor of Science in Information Technology.

The eight modern computing laboratories housed by the Computer Science Department include three general purpose labs equipped with desktop PCs, two labs equipped with workstations with dual-boot capability, supporting both Windows and UNIX operating system environments, two labs configured with isolated networks that allow midshipmen to explore and experiment with network security, and a robotics laboratory equipped with vision systems, desktop computers and mobile robots. All labs are used by both Information Technology and Computer Science majors.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NN200, NS300, NL310, NL400, NS42X;
Mathematics: SM223, SM242;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives including one at the 300/400 level;
Engineering: EE301, EE303, EM300, ES300, ES360, EA/N4XY and a free elective;
Major: IC210, IC211, IC220, IC221, IC312, IC322, IT350, IT360, IT430, IT440, IC480, and three major electives.

Information Technology Courses

IC210 Introduction to Computing (3-2-4). Introduction to algorithmic development, problem solving and software design. Principles and concepts to provide foundational knowledge and experience upon which later computing courses will build. This is the first course for computer science and information technology majors. *Prereq: none.*

IC211 Object Oriented Programming (2-2-3). This course builds on the procedural programming skills developed in the prerequisite course and introduces the student to object oriented programming and design principles using Java. Object oriented topics such as classes, inheritance, information hiding, polymorphism and dynamic binding are presented and used to create robust, reusable, and maintainable software. The fundamentals of Java are presented along with exception handling, I/O, event driven programming, simple GUIs and generics. *Prereq: IC210 or SI204.*

IC220 Computer Architecture and Organization (3-0-3). This course introduces students to performance metrics, instruction set architectures, assembly language, logic design, memory hierarchies, and pipelining. *Prereq: IC210 or SI204 or permission of department chair.*

IC221 Systems Programming (2-2-3). The study of an application's interface with the operating system. The operating system is treated as an information resource, and as a facilitator for information flow between processes, including those executing on separate machines. Topics include: process management, multiprogramming, and the basic concepts necessary to understand the design and operation of computer communication networks. *Prereq: (IC210 or SI 204 or permission of department chair); Coreq: IC220.*

IC312 Data Structures (3-0-3). This course examines abstract data types (ADT), data structures, data representation and information management including storage structures, allocation and collection. ADTs and data structures presented include lists, stacks, queues, trees, heaps, priority queues, maps, dictionaries and graphs. Sorting and searching techniques, hashing and graph algorithm analysis are also covered. *Prereq: (IC211 or permission of department chair); Coreq: SM242.*

IC322 Computer Networks (2-2-3). The course presents the fundamental theoretical concepts, characteristics and principles of computer communications and computer networks, and analyzes and assesses these foundational concepts with respect to network performance and network design. *Prereq: (IC221; Coreq: SM242) or permission of department chair.*

IC480 Research Sminar/Capstone (1-4-3). This is a capstone course that ties together concepts from the information technology and computer science curriculums to solve a practical problem. These team-oriented project solutions will include the requirements gathering, analysis, design and development of a computing system involving a large, multi-layer organization using appropriate information management and computing technologies. *Prereq: SI336 or IT440 or permission of department chair.*

IT350 Web and Internet Programming (2-2-3). Web site design and management, clients and servers, client and server side scripting languages, web transmission protocols. *Prereq: IC210.*

IT360 Applied Database Systems (2-2-3). This course introduces the principles underlying Database Management Systems (DBMS) with a special emphasis on database management system structure and function when integrated with web-based database applications. *Prereq: IC312 and IT350.*

IT430 Information Assurance and Network Security (2-2-3). This course is an introduction to the theoretical and practical facets of Information Assurance (IA) to include: Department of Defense (DoD)/Department of the Navy (DoN) policies and directives, Trusted systems, Access mediation, Cryptography, Public Key Infrastructure (PKI), Information Warfare, Network security and Database security. Laboratory work will include student exercises demonstrating information assurance concepts culminating in a vulnerability analysis of given systems. *Prereq: IC322.*

IT432 Advanced IA and Network Security (2-2-3). This course provides an introduction to topics in secure system design, including: cryptography, operating system security, and language based security. Where the IT430 course focuses primarily on securing an existing system, this course studies how to design a system to meet security goals. Students will design and implement components of a secure system. *Prereq: IT430 or permission of department chair.*

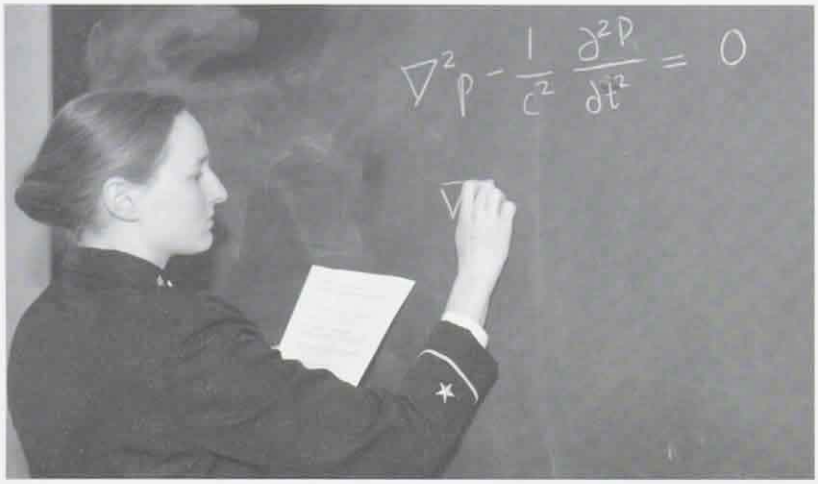
IT440 Systems Analysis and Design (2-2-3). Introduction to concepts and methods used in analyzing and designing information technology systems. Topics include: Software Life-Cycle, Software Process, system requirement definition, requirement analysis, system design, implementation, testing, project management techniques and tools, and Computer Aided Software Engineering (CASE) tools and methodologies. Using a course-long, class-wide project, the students gain real-life experience in analyzing and designing systems, as well as working in teams. *Prereq: IT350 and IT360.*

IT452 Advanced Web and Internet Systems (2-2-3). Web server design and configuration, search engine design and usage, web security and authentication, servlet implementations, web collaboration mechanisms, web services, and knowledge representation on the web. *Prereq: IT350.*

IT460 Human Computer Interaction (2-2-3). An introductory course emphasizing interactive software design, development and evaluation using a human-centered approach. Topics include aspects of human sensation, perception and cognitive psychology. *Prereq: IC312 or IT350.*

IT462 Advanced Database Systems (2-2-3). This course will discuss advanced issues in database systems, including parallel, distributed and peer-to-peer databases, data warehousing and data mining, XML and service-oriented architectures. The course incorporates hands-on exercises using commercial database systems and products, as well as a web-database project. *Prereq: IT360 or SI440.*

IT470 Enterprise Computing (2-2-3). This course develops architectures and concepts for the development of multi-tier (typically 3-tiered) distributed applications for an entire organization or enterprise. This includes a user interface called the client tier or tier 1, a server component which is controlled by the organization and provides for interaction with and data collection from the user (tier 2) and a database component that stores transactions and updates client profiles (tier 3). The course teaches advanced techniques for network programming as well as server management and programming. *Prereq: (IC322 or IT340) and (IT360 or IT420).*



Mathematics Department

Mathematics Major

The mathematics major *(http://www.usna.edu/Math Dept.)* teaches logical and critical thinking; fundamental abilities that are invaluable to Naval and Marine Corps officers. Mathematics plays a central role in virtually every technical and scientific field and is crucial in developing and applying modern, accurate models used to evaluate systems and tactics in all phases of the modern battlefield. Mathematics majors learn to analyze problems, formulate solutions, and express results in a clear and precise manner. These same skills are applied aboard a ship or submarine, inside a fighter jet or on the ground. The mathematics major also provides an excellent foundation for graduate work in any technical field as well as in business or law. A bachelor of science degree is awarded.

Elective courses offer the opportunity to study a wide variety of topics such as operations analysis, fluid flows, cryptography, chaos, wavelets, fractals, target motion analysis, submarine tactics, elliptic curves, computer arithmetic, and geometric tomography for medical diagnosis. The mathematics honors program allows selected students to do in-depth research in such fields. The Mathematics Department consists of about 60 faculty members who are actively engaged in teaching and research. About 20 military officers on the faculty bring first-hand experience in applying mathematics and mathematical thinking to specific Naval and Marine Corps problems. The civilian faculty devotes substantial time to current research in various specialty fields in pure and applied mathematics, as well as in operations research.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Science: SP211, SP212;
Humanities: HH2XY, HH216, and two electives including one at the 300/400 level;
Engineering: EA400 or EN400 or EN401, EE301, EE302, EM300, ES300, ES360; one mathematics, science, or engineering (MSE) elective;
Mathematics: SM221, SM222;
Major - Both Tracks: SM261, SM280, SM233, SM291, SM239, SM331, one free elective;
Applied Mathematics Track: SM365, SM339, applied math capstone course, three applied mathematics track electives (at least one at the 400 level), one additional major elective.
Mathematics Track: SM3625, SM334 or SM411 or SM461 or SM462, mathematics capstone course, two mathematics track electives, two additonal major electives (at least one at the 400 level). At least one mathematics track course in addition to the capstone must be at the 400 level.

General Science Major

The major in general science gives students the opportunity to pursue a broad, scientifically-oriented program in the field of physical applications of mathematics and science. The major permits midshipmen to experience an interdisciplinary technical program without the need for specialization. A bachelor of science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM221 or SM223, SM230;
Science: SP211, SP212;
Humanities: HH215, HH216 and two electives including one at the 300/400 level;
Engineering: EA400 or EN400 or EN401, EM300, EE301, EE302, ES300, ES360, and a free elective;
Major: NP340, SA302, SI200, SB211, SM212, SO231, SO244, SP301, SP411, a free elective, and two math/science/engineering electives.

Quantitative Economics Major

The major in quantitative economics is interdisciplinary, focusing on applications of mathematics to economic reasoning and economic problems. The major provides students with a broad set of mathematical tools and a solid background in economic theory. About half of the courses required are taken in economics; the other half are in mathematics. The major is jointly administered by the Departments of Mathematics and Economics. A bachelor of science degree is awarded.

Curriculum Requirements: (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM223 and SM239;
Science: SP211, SP212;
Humanities:HH215, HH216 and two electives, including one at the 300/400 level.
Engineering: EA400 or EN400 or EN401, EM300, EE301,EE302, ES300, ES360, and a free elective;
Major: FE210, FE312, FE341, FE445, SM261, SM279, SM339, SA401, SA475E, and five major electives.

Mathematics and Operations Analysis Courses

Mathematics Courses

SM005 Pre-Calculus Mathematics (4-1-4). Basic review of algebraic and arithmetic operations, analysis of functions and their graphs, and trigonometry. This course may be required in addition to stated graduation requirements for certain midshipmen. *Prereq: placement by department chair.*

SM121 Calculus I (4-0-4). The first of a traditional two-course sequence covering differential and integral calculus of one real variable and infinite series. *Prereq: none.*

SM122 Calculus II (4-0-4). Contitnuation of Calculus I. *Prereq: Calculus I (SM121 or SM131 or SM161).*

SM131 Calculus I (3-0-3). The first of a traditional two-course sequence covering differential and integral calculus of one real variable and infinite series for students who have prior differential calculus experience. *Prereq: placement by department chair.*

SM161 Calculus with Computers I (5-0-5). The first of a two-course sequence presenting an algorithmic development of the differential and integral calculus of one real variable and an introduction to programming. *Prereq: permission of the department chair.*

SM162 Calculus with Computers II (5-0-5). Continuation of SM161. *Prereq: SM161.*

SM212 Differential Equations (4-0-4). Linear and simultaneous differential equations, solution by Laplace transform; partial differential equations and Fourier series. *Prereq: Calculus III (SM221 or SM223).*

SM219 Introductory Statistics (3-0-3). Nature of statistical methods, description of data, probability, distributions, estimation, tests of hypothesis, correlation, regression. Credit cannot be given for SM219 if credit has been given for SM230 or SM239. *Prereq: SM122 or SM162.*

SM221 Calculus III with Vector Fields (4-0-4). Differential and integral calculus of several real variables; vector analysis including integral theorems. *Prereq: Calculus II (SM122 or SM162).*

SM222 Differential Equations with Matrices (4-0-4). A more rigorous treatment of material from SM212, the course uses basic ideas from linear algebra. Intended for mathematics and quantitative economics majors. *Prereq: Calculus III (SM221 or SM223); Coreq: SM261.*

SM223 Calculus III with Optimization (4-0-4). Differential and integral calculus of several real variables; vector analysis; optimization techniques for functions of several variables. *Prereq: Calculus II (SM122 or SM162).*

SM230 Probability with Naval Applications (3-0-3). An elementary treatment of the basic concepts of probability with an emphasis on naval applications. Sample spaces, discrete and continuous random variables and standard distributions. Selected topics of naval applications of probability theory such as random search, minefields and lateral range curves. Conditional probability and Bayes' theorem. *Prereq: Calculus II (SM122 or SM162).*

SM233 Introduction to Applied Mathematics (2-2-3). This course introduces student to several fundamental topics in applied mathematics: simulation and staatistical modeling, applications of linear algebra, partial differential equation models, and computational tools and topics. Appropriate computer software will be introduced. *Prereq: Calculus III (SM221 or SM223); Coreq: SM261.*

SM239 Probability and Statistics I (3-0-3). An applied study of a variety of discrete and continuous probability models. Probability models covered include binomial, Poisson, exponential, gamma, normal, Student-t, and chi-squared. Methods for calculating probabilities and estimating parameters are included. The Law of Large Numbers and the Central Limit Theorem are included. This course is both a stand-alone course and a prerequisite for Applied Statistics I (SM339). Credit will not be given for both SM239 and SM230. *Coreq: Calculus III (SM221 or SM223).*

SM242 Discrete Mathematics and Probability (4-0-4). Introduction to first order logic, set theory, proof techniques, counting principles, graph theory, matrix operations, discrete random variables and analysis of algorithms. Credit cannot be given for SM242 if credit has been given for SM342. *Prereq: SM122 or SM162.*

SM259 Mathematical Logic (3-0-3). Mathematical languages, formal logic, propositional calculus and truth tables, first order predicate calculus, proof theory, axiomatic systems and model theory. Applications to logical networks and nonstandard analysis. *Prereq: Calculus II (SM122 or SM162).*

SM261 Matrix Theory (3-0-3). Matrices, transformations, linear equations, vector spaces, characteristic matrix, eigenvalues, orthogonality. *Prereq: Calculus II (SM122 or SM162).*

SM279 Multivariable Calculus (3-0-3). An introduction to the geometry and analysis of n-dimensional space, including topics on multidimensional curves, inner products, linear functions, real valued functions, Taylor approximations, optimization, inverse function theorem, implicit function theorem, and change of variables in integration. Applications to economics and physics will be discussed. *Prereq: (SM221 or SM223) and SM261.*

SM280 Topics in Mathematics (1-0-1). An overview and sampling of topics from a variety of mathematical disciplines including both tracks of the mathematics major. Students will be exposed to the power, beauty, and utility of mathematics. *Prereq: Calculus II and SMA or SMP major or permission of department chair.*

SM291 Fundamentals of Mathematics (3-0-3). Introduction to mathematical reasoning and the written and oral presentation of mathematical concepts, theory, and application of sets and relations. *Prereq: Calculus II. SQE majors may not take both SM291 and SM222.*

SM311 Engineering Mathematics I (3-0-3). Vector analysis, Fourier analysis, partial differential equations, Sturm-Liouville problems, Legendre polynomials, determinants, and matrices. *Prereq: Differential Equations (SM212 or SM222).*

SM312 Engineering Mathematics II (3-0-3). Laplace and Fourier transforms, selected topics from complex variables. *Prereq: Differential Equations (SM212 or SM222).*

SM313 Probability with Applications to EE (3-0-3). A first course in probability with many examples and exercises drawn from electrical engineering. Knowledge of calculus (including multivariable) is assumed. The course covers basic counting techniques, properties of probabilities, discrete and continuous random variables, expectation values, variance, covariance, joint probability distributions, functions of random variables, moment generating functions, the Central Limit Theorem, random sampling, and sampling distribution of means. The emphasis is on understanding the random variable concept. *Prereq: Differential Equations (SM212 or SM222).*

SM315 Introduction to Partial Differential Equations (3-0-3). Linear equations, Cauchy problems, Laplace and Poisson equations, boundary value problems, heat equations, Sturm-Liouville problems, and orthonormal expansions. *Prereq: Differential Equations (SM212 or SM222).*

SM316 Engineering Mathematics with Probability and Statistics (3-0-3). Basic concepts in probability and statistics, Fourier analysis, and complex variables with applications. Does not count as a major elective for the mathematics major. *Prereq: Differential Equations (SM212 or SM222).*

SM321 Topics in Applied Mathematics (3-0-3). Junior level topics in applied mathematics. The content will vary in order to keep abreast of new ideas and approaches. *Prereq: permission of department chair.*

SM331 Advanced Calculus I (4-0-4). Real numbers, sequences, limits of sequences, limits of functions, continuity, properties of continuous functions, differentiability, Riemann Integral, series, power series. *Prereq: SM261 and SM291.*

SM331H Real Analysis I (4-0-4). Honors versions of SM331. *Prereq: permission of department chair.*

SM332H Real Analysis II (4-0-4). Honors version of SM334. *Prereq: permission of department chair.*

SM334 Elements of Advanced Calculus (3-0-3). This course is a continuation of SM331. Together the courses cover logic, induction, sequences, limits, real numbers, series, continuity, differentiability, properties of continuous functions, the Riemann Integral, and power series. *Prereq: SM331.*

SM339 Applied Statistics I (3-0-3). An applied study of a variety of statistical methods used in obtaining, presenting, summarizing and analyzing statistical information. Included are strategies for data collection and presentation, and techniques of statistical inference for population, parameters based on the concepts of sampling, probability and distribution theory. *Prereq: SM239 and SM261*

SM342 Discrete Structures (3-0-3). Foundations and methods of proof. Combinatorics, graph theory, group theory. Selected topics. *Prereq: SM122 or SM162.*

SM362 Modern Algebra (3-0-3). Integers, groups, mappings, rings, fields. *Prereq: SM261 and SM291.*

SM365 Introduction to Scientific Computing (4-0-4). Computer arithmetic and errors; algorithms and programs for: iterative solution of equations, linear systems of equations, function approximations, numeric integration, and the numerical solution of ordinary differential equations; an introduction to programming. *Prereq: SM261.*

SM411 Introduction to ComplexVariables (3-0-3). This course extends the techniques of differential and integral calculus to the complex numbers. Highlights include Cauchy's theorem on integration, the residue theorem, and power series expansions. Applications to real analysis and physical problems will be discussed. *Prereq: SM331.*

SM415 Mathematical Modeling of the Ocean and Atmosphere (3-0-3). Mathematical Modeling of the Ocean and Atmosphere. Vector analysis, Fourier analysis, partial differential equations with emphasis on stream and potential functions, conservation of mass, conservation of linear momentum (Navier-Stokes Equations) in rectangular and rotating coordinate systems. Use of MATLAB to solve applied problems in oceanography and meteorology. *Prereq: SO414 or permission of instructor.*

SM421 Topics in Applied Mathematics II (3-0-3). Senior level topics in applied mathematics. The content will vary in order to keep abreast of new ideas and approaches. *Prereq: permission of department chair.*

SM425 Advanced Numerical Analysis (3-0-3). Numerical solution of equations in one and several variables, direct and iterative algorithms, rate of convergence. Computer methods emphasized. *Prereq: (SM212 or SM222) and (SM331or approval of department chair) and SM365 and (SM233 or experience with MATLAB).*

SM426 Numerical Methods for Differential Equations (3-0-3). Interpolation and polynomial approximation, numerical integration and differentiation, numerical algorithms for initial value and boundary value problems. *Prereq: (SM212 or SM222) and (SM331 or approval of department chair) and SM365 and (SM233 or experience with MATLAB).*

SM439 Topics in Statistics (3-0-3). Senior level topics in statistics. The content will vary in order to keep abreast of new ideas and approaches. *Prereq: SM339 or permission of department chair.*

SM444 Discrete Structures II (3-0-3). Topics in combinatorics and graph theory, with applications. Latin squares, linear algebra and combinatorics, finite projective planes, topological graph theory, Ramsey theory, trees. *Prereq: SM342.*

SM461 Linear Algebra (3-0-3). Vector spaces, linear transformations, Jordan canonical form, inner product spaces. *Coreq: SM261 and SM331.*

SM462 Algebraic Structures (3-0-3). Groups, rings, fields, Galois theory. *Prereq: SM362 and SM331.*

SM463 Topics in Analytical/Discrete Mathematics (3-0-3). Senior level topics in pure mathematics. The content will vary in order to keep abreast of new ideas and approaches. *Prereq: permission of department chair.*

SM464 Topology (3-0-3). A mathematical analysis of topological spaces, separation axioms, covering properties, and metric spaces. *Prereq: SM331.*

SM472 Projects in Mathematics (3-0-3). This course is a capstone course for the mathematics track of the mathematics major. Students will read and make presentations on topics determined by the instructor. Each student will complete a project on a topic to be agreed upon by the instructor and student. Students will present their results in writing and orally. *Prereq: 1/C SMA major or permission of department chair.*

SM473 Projects in Mathematics and Applied Mathematics (3-0-3). This course is a capstone course for both the mathematics track and the applied mathematics track of the mathematics major. Students will read and make presentations on topics determined by the instructor. Each student will complete a project on a topic to be agreed upon by the instructor and student. Students will present their results in writing and orally. *Prereq: 1/C math major or permission of department chair.*

SM474 Projects in Applied Mathematics (3-0-3). This course is a capstone course for the applied mathematics track of the mathematics major. Students will read and make presentations on topics determined by the instructor. Each student will complete a project on a topic to be agreed upon by the instructor and student. Students will present their results in writing and orally. *Prereq: 1/C SMP major or permission of department chair.*

Operations Analysis Courses

SA302 Analysis of Naval Tactics (3-2-4). An introduction to the techniques of modeling and quantitative analysis applied to specific naval operational problems, including search and patrol, screening, anti-air warfare, mining, equipment reliability and decision rules. Does not count as major elective for Mathematics majors. *Prereq: SM219, SM239 or SM230.*

SA367 Introduction to Mathematical Modeling (3-0-3). Realistic problems, often of military interest, are formulated mathematically and solved using techniques from probability, statistics, calculus and differential equations. The analysis is carried out by students working in small teams and individually. Solutions are presented in oral nontechnical briefings and in written technical reports. *Prereq: SM219, SM239 or SM230.*

SA401 Linear Models and Optimization (3-0-3). Investigation of fundamentals of linear optimization subject to constraints, including construction and analysis of linear programming and network problems. *Prereq: SM261.*

SA402 Dynamic and Stochastic Models (3-0-3). Investigation of quantitative analysis of decision options, including dynamic programming, decision trees, Markov chains and queuing theory. Applications to typical operations are stressed. *Prereq: (SM239 or SM230) and SM261.*

SA410 Applications of Search and Detection Theory (3-0-3). Considerations in picking a measure of effectiveness (MOE) for use in analyzing decision options and decision criterion are studied. The focus of the course is the analysis of search and detection operations, particularly as they arise in anti-submarine operations, using probability models. Barrier detection, area search and parallel sweep operations models are developed. Additional topics in mine warfare, target coverage models, anti-air warfare, and target motion analysis may be picked for study by the instructor. Credit cannot be given for both SA302 and SA410. *Prereq: SM239 or SM230.*

SA412 Projects in Operations Analysis (3-0-3). Operations research techniques are applied using student projects, case studies and visiting lecturers. Topics include current military and industrial problems. *Prereq: permission of department chair.*

SA421 Simulation Modeling (3-0-3). Discrete simulation of systems using a simulation language. Includes random number generation, validation and verification of simulations, input and output data analysis. Semester projects are done as part of an analysis team. *Prereq: SM339.*

SA430 Logistics (3-0-3). Investigation of techniques of operations analysis applicable to the solution of problems in reliability, maintainability, availability and inventory. *Prereq: SM239 or SM230.*

SA442 Applied Statistics II (3-0-3). A continuation of SM339 that includes examination, evaluation and application of advanced statistical methods. Techniques studied include sampling, nonparametric analysis, simple and multiple regression, correlation, analysis of variance and decision theory. *Prereq: SM339.*

SA475 Projects in Operations Anaylsis or Statistics (3-0-3). This course is a capstone course for the applied mathematics track of the mathematics major. Students will read and make presentations on topics determined by the instructor. Each student will complete a project on a topic to be agreed upon by the instructor and student. Students will present their results in writing and orally. *Prereq: 1/C SMP major or permission of department chair.*

SA475E Research Seminar in Quantitative Economics (3-0-3). Directed research on a specific topic. Capstone course for Quantitative Economics majors. Emphasis on empirical work using computers. *Prereq: 1/C SQE major.*

Oceanography Department

Oceanography Major

The oceanography major gives future naval officers practical and theoretical knowledge of the ocean environment and builds a sound academic foundation for future graduate study in any technical discipline. An interdisciplinary science major, oceanography involves the study of meteorology, geophysics, physics, chemistry, biology and geology as they relate to the ocean environment. Basic courses in these areas are prerequisites for more advanced oceanography and meteorology courses. Students take courses in sound propagation in the ocean, the study of waves and tides, and the use of satellites in oceanography. A course in advanced biological oceanography offers a glimpse of the undersea world and its marine creatures; synoptic meteorology courses involve hands-on weather forecasting experience using the latest tools available. More than 25 percent of the required course load is within the oceanography specialty. Other courses include advanced mathematics, necessary to describe the complex behavior of fluid environments. A bachelor of science degree is awarded. An honors program with a designated honors degree is available for selected students.

The Naval Academy boasts the most extensive undergraduate oceanographic facilities in the country. Located on a pier adjacent to the mouth of the Severn River, the Hendrix Oceanography Laboratory is a multi-function enclosure featuring a wet laboratory where students study the world's largest estuary, the Chesapeake Bay. Midshipmen have the opportunity to participate in a three-week oceanography cruise during the summer training period. The academy's oceanographic research vessel enables midshipmen to collect samples and oceanographic data afloat and deliver them to the department's shore labs. Another laboratory complex in Rickover Hall houses the geological, biological, chemical, general oceanographic and remote sensing laboratories. A separate meteorological laboratory has an on-line receiver to display charts from the National Oceanic and Atmospheric Administration and the Naval Meteorology and Oceanography Command, direct access to the World Meteorological Organization's data network, a color weather radar display, and a high resolution satellite receiver, all of which can be accessed via computer workstations. Students use all of these facilities in required courses as well as in their electives.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM221, SM212, SM415;
Science: SP211, SP212, SP411;
Humanities: HH215, HH216 and two electives including one at the 300/400 level;
Engineering: EN400 (or EN401 or EA400), EM300, EE301, EE302, ES300, ES360, and a free elective;
Major: SO231, SO234, SO244, SO335, SO345, SO414, SO416, SO470x, plus three major electives.

Oceanography Courses

SO221 Introduction to Oceanography (3-0-3). A descriptive course designed to provide an overview of significant oceanographic factors and their impact on engineering applications. *Prereq: Non-SOC majors only.*

SO231 General Oceanography I (3-2-4). A descriptive survey of and introduction to geological, chemical and physical oceanography. Course content spans subjects such as sea floor spreading, properties and composition of seawater and ocean currents and water masses. A historical perspective is provided. Laboratory exercises concentrate on Chesapeake Bay parameters as seasons change. *Prereq: none.*

SO234 General Oceanography II (2-2-3). Continues introduction to physical oceanography, with emphasis on the interactions of physical processes in the oceans: geological, biological and chemical. Sediment distribution, characteristics, classification and sedimentation processes; marine volcanism and diagenesis; chemical properties of sea water, marine cycles and distribution of nutrients and gases in the oceans; marine productivity, diversity and the strategies employed by productivity, diversity and the strategies employed by marine organisms are included. *Prereq: SO231.*

SO244 Basic Atmospheric Processes (2-2-3). An introductory course designed for oceanography majors, as well as those interested in taking advanced meteorological electives. This course treats the basic meteorological variables and instruments used for atmospheric measurements, physical processes governing the sun-earth-atmosphere thermal system, basic atmospheric thermodynamics, the chemical and temperature structure of earth's atmosphere, cloud and precipitation physical processes, basic atmospheric circulations and accompanying weather and climatic patterns, as well as an introduction to common meteorological data products used in weather analysis and prediction. *Prereq: none.*

SO262 Physical Geography (3-0-3). The physical environment influences natural resources, human culture, national security, and military operations. This course examines the basic scientific principles of physical geography and how location on earth influences climate, landforms, soils, and natural vegetation. We will study the processes at work, the features created and their spatial distributions. We will use satellite imagery and geographical information systems to look at case studies around the world and examine the wide range of natural environments. *Prereq: none.*

SO335 Oceanographic and Meteorological Quantitative Method (2-2-3). A course to expose students to products and datasets that are available in oceanography and meteorology and techniques for manipulating the data to arrive at a better quantitative understanding of the oceans and atmosphere. *Prereq: SM221, SO231, and SO244.*

SO345 Atmospheric Thermodynamics (3-2-4). A study of the thermodynamic and kinematic properties of the atmosphere, including the effects of temperature, moisture and wind processes, introduces the forces responsible for atmospheric motions. This course uses thermodynamic diagrams for analyzing vertical profiles of atmospheric variables, as well as conventional and remotely-sensed data to analyze horizontal distributions of meteorological fields. *Prereq: SO244.*

SO345H Honors Atmospheric Thermodynamics (3-2-4). Course is an advanced version of SO345 for honor students and includes laboratory exercises which will make extensive use of the computerized Meteorology Laboratory. *Prereq: SO244.*

SO381 Tactical Oceanography (1-0-1). Oceanographic and bathymetric factors in the battle space play a significant role in mission planning and execution. The natural environment is an important consideration in the decision-making process regarding the timing of military operations and the employment of weapons, platforms, and tactics. This course provides an overview of oceanographic and bathymetric variability and the potential impact of surface and subsurface features on naval operations. *Prereq: 2/C or 1/C standing or by permission of department chair.*

SO382 Aviation Meteorology (1-0-1). Weather is a crucial element in flight operations, affecting both aircraft performance and safety. This course will provide an overview of meteorological factors that impact flight operations, with particular emphasis on weather hazards and weather products that can assist the pilot with these hazards. Students who intend to select or have selected naval aviation for their warfare specialty will be given first preference for this course. *Prereq: 2/C or 1/C standing or by permission of department chair.*

SO414 Oceanic and Atmospheric Processes (3-2-4). Fundamental equations of motion governing the dynamics of quasi-horizontal, inviscid and viscous fluid flow on the rotating earth are developed. Scale analyses of the basic hydrodynamic equations are used to identify forces responsible for motions of interest. Basic numerical modeling techniques for both oceanic and atmospheric processes are introduced. Laboratory exercises will utilize the MATLAB software package to solve hands-on problems pertaining to fluid flow. *Prereq: SO345 and SO335.*

SO416 Waves and Tides (2-2-3). The dynamics of surface, internal, and capillary waves; wave statistics and spectrum; principles of wave forecasting; tide generating forces and tidal prediction; seiches, bores and surges are mathematically analyzed. *Prereq: SO414.*

SO422 Nearshore Oceanography (2-2-3). Examines the oceanographic regime from the continental shelf break to the intertidal zone and coastal dunes. Concentrates on shallow water wave, surf and beach processes. Includes a discussion of coastal management and engineering procedures. *Prereq: SO231 or SO221.*

SO426 Polar Oceanography (2-2-3). A descriptive course which covers the history of polar exploration as well as the physical oceanography and meteorology of the polar regions with particular emphasis on the role of sea ice in global warming studies. Current DoD polar programs will be reviewed including the following: Deep Freeze, International Ice Patrol and Navy operations such as ICEX and TEAMWORK. *Prereq: SO221 or SO231.*

SO427 Introduction to Estuarine Oceanography (2-2-3). The physical, geological and biological aspects of the estuarine environment are studied. Laboratory sessions, which include YP cruises and field trips, focus on practical and hands-on applications. Environmental issues such as water quality and pollution are discussed. The use of numerical models as a tool is explored. *Prereq: SO221 or SO231.*

SO431 Environmental Remote Sensing (2-2-3). An overview is given of the various platforms and sensors currently in use and planned. The electromagnetic spectrum and radiation laws are explained. Applications exercises give "hands-on" experience with image processing systems. *Prereq: SO221 or SO231.*

SO432 Geographical Information Systems (2-2-3). Geographical Information Systems (GIS) use computers to manipulate geographic data, combining maps and data bases. This course examines the basics of map projection and datums, raster and vector data bases, and the design, manipulation, and analysis of geographic data. We will discuss the use of remote sensing to collect data and provide background maps, and the use of digital elevation models to provide a framework for 3D display. *Prereq: SO221 or SO231.*

SO441 Synoptic Meteorology (2-2-3). A practical course in meteorological analysis and forecasting as applied to operational planning. A variety of meteorological datastreams available in the computerized Meteorology Laboratory are used to analyze and predict the current and future state of the atmosphere. *Prereq: SO244.*

SO442 Tropical Meteorology (2-2-3). A study of the special processes affecting meteorological analysis and forecasting in the tropics, including satellite imagery analysis, with particular emphasis on hurricane or typhoon prediction, creation, movement and decay. *Prereq: SO244.*

SO445 Global Climate Change (2-2-3). Global climate past and present is examined from the modern records using satellites, land/sea observations, ice cores, etc. Different global change model scenarios are presented and discussed for future climate - Earth Watch. Also studied are present day climate topics, such as the Ozone Hole, Greenhouse Effect and El Nino. *Prereq: SO244.*

SO451 Biological Oceanography (2-2-3). A study of patterns and concepts of biological production in the ocean. Emphasis is on the integration of the biological and physical environment. Laboratory includes student planned studies and conceptual exercises. All aspects of the course emphasize the use of various knowledge areas to solve a problem. *Prereq: SO234.*

SO461 Geological Oceanography (2-2-3). Introduces marine geological/geophysical instrumentation, theory, data collection, analysis, interpretation and applications. Geomorphology, structure, petrology, sedimentation, stratigraphy, origin and development of ocean basins and margins are examined in light of theory of plate tectonics. Practical studies of the Chesapeake Bay are part of the laboratory work. *Prereq: SO234.*

SO470 Capstone Seminar (3-0-3). A course for SOC majors to provide guidance on the construction of the capstone paper and the oral presentaion of the capstone paper. The course will include background readings and corresponding discussions, and instruction on scientific writing and presentation. The course culminates in the production of the capstone paper and the oral presentation the capstone paper. Four versions of this course are offered: SO470A Capstone Seminar in Biological Oceanography SO470B Capstone Seminar in Geology and Geographical Information Systems SO470C Capstone Seminar in Meteorology SO470D Capstone Seminar in Physical Oceanography. *Prereq: 1/C oceanography major.*

SO480 IT Research Seminar (SO) (3-0-3).

SO503 Honors Research Methods in Oceanography and Meteorology (2-2-3). Statistical methods and techniques applied to research topics, oceanographic and laboratory instrumentation, remote sensing and mathematical modeling. Discussion of current research topics. Prepares students to undertake independent research in oceanography or meteorology. *Prereq: 2/C honors oceanography major.*

SO505 Honors Independent Research (0-6-3). Independent research in oceanography or meteorology on a subject of the student's choice, culminating in a written report and a presentation to the faculty. *Prereq: SO503 and SOCH major.*

SO506 Honors Independent Research (0-6-3). Independent research in oceanogrphy or meteorology on a subject of the student's choice, culminating in a written report and presentation to the faculty. *Prereq: S0503 and SOCH major.*

SO513 Honors Oceanic and Atmospheric Processes (3-2-4). Course is an advanced version of SO414 for honors students. *Prereq: SM311O and S0345H.*

SO516 Honors Waves and Tides (2-2-3). Course is an advanced version of SO416 for honor students. *Prereq: SO513 and SOCH major.*

Physics Department

Physics Major

The physics major's program presents fundamental physical concepts and develops the student's experimental techniques to provide a strong foundation for further work in a broad range of technical fields. The challenge in physics lies in mathematically uniting its laws and definitions with the integrative reasoning essential in modeling and solving real-world problems. In addition to the traditional physics track (SPH), an astrophysics track (SPAA) and an applied physics (SPA) track are available. The astrophysics track focuses on applying physics and astronomy and cosmology, including an introduction to observational techniques. The applied track allows a focus on applications of physics in the other engineering and science disciplines. A Bachelor of Science degree is awarded.

Among the topics physics majors master are: the theory of relativity, mechanics, electromagnetism, quantum mechanics, field concepts, and the origin, propagation and reception of waves of all kinds. All are studied with the object of developing an open-minded, creative, and analytical approach to the physical world and problem-solving – an approach increasingly important to those who will be the leaders in the Navy of the future. The physics major is excellent background for most of the major career paths in the U.S. Navy and Marine Corps. Recent graduates have chosen the Navy's nuclear power, aviation, and surface line communities, as well as both the ground and aviation components of the Marine Corps. Opportunities for work towards advanced degrees are available to qualified physics majors prior to graduation, immediately after graduation, and later in their careers.

In physics, laboratory work is emphasized and students will have access to eight laboratories including special facilities for acoustics, atomic physics, nuclear physics, laser optics, and macroscopic and nanoscopic solid state physics. There are several additional research laboratories, a photographic darkroom, and well-equipped machine and electronics shops. Major instruments include a Pelletron accelerator, an 8-inch Clark refracting telescope, a 20-inch reflecting telescope, two anechoic chambers, nuclear magnetic resonance facilities, high resolution spectrographs, an x-ray diffractometer, femtosecond and picosecond laser systems, a superconducting magnet, various cryogenic systems, a high-performance computing cluster, and numerous computers for use in data collection and processing.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NL310, NL400, NN200, NS300, NS42X;
Mathematics: SM212, SM221;
Humanities: HH215, HH216 and two electives including one at the 300/400 level;
Engineering: EE301, EE302, EA400 (or EN400 or EN401), EM300, ES300, ES360, mathematics, science or engineering elective;
Major: SP221, SP222, SP226, SP324, SP327, SP333, SP342, SP351, SP352, SP425, SP444, plus two physics electives;
Applied Physics Track: replace SP425 and SP444 and two physics electives with four additional electives approved by the Director of the Applied Physics Track.
Astrophysics Track: replace SP425, SP444 and two additional electives with SP310, SP445, SP446 and SP447.
Other: Math/Science/Engineering elective and one free elective.

Physics Courses

SP211 General Physics I (3-2-4). The first of a two course sequence emphasizing the fundamental principles of classical physics and their various applications. Topics include mechanics, electricity, magnetism, wave motion, fluids, sound and light. Lectures, recitations, hands-on laboratories, and large-scale demonstration lectures are employed. *Prereq: Chemistry II (SC112 or SC151); Coreq: Calculus III (SM221or SM223 or SM251) or approval of department chair.*

SP212 General Physics II (3-2-4). Continuation of SP211. See SP211 description for topics. *Prereq: Physics I (SP211 or SP221) or approval of department chair.*

SP221 Physical Mechanics I (3-2-4). A first course in classical mechanics for physics majors. Newton's laws are applied to particles and systems of particles. Energy and momentum methods are developed. Applications include simple, damped, and driven harmonic motion as well as gravitation and orbital motion. *Prereq: Chemistry II (SC112 or SC151); Coreq: SM221 or approval of department chair.*

SP222 Electricity and Magnetism I (3-2-4). A first course in electricity and magnetism for physics majors, with an emphasis on the concepts of fields and potential. The course culminates in the formulation of Maxwell's equations. *Prereq: SP221 or SP211.*

SP226 Heat, Sound and Light (3-2-4). A first course on the basic concepts of thermodynamics, acoustics, and optics for physics majors. Topics include heat engines, refrigerators, cosmology, the Doppler effect, beats, shock waves, fluids, lenses, telescopes, polarization, interference and diffraction. *Prereq: SP211 or SP221.*

SP301 Modern Physics (3-0-3). An introduction to the theories of relativity and quantum mechanics. Topics include relativistic mechanics, blackbody radiation, wave-particle duality, the Bohr theory, quantum phenomena, nuclear decay and nuclear reactions. *Prereq: SP212 or SP226.*

SP310 Astronomy (3-0-3). The fundamentals of astronomy as a physical science, surveying the Universe from the solar systems through stellar, galactic and extragalactic astronomy and cosmology. *Prereq: SP211 and SP212, SP222 and SP226 or approval of director of the astrophysics track.*

SP324 Applications of Quantum Mechanics (3-2-4). Applications of quantum mechanics to physical systems. Topics covered are quantum statistics, multi-electron atoms, molecules, properties of solids, superconductivity, nuclear models and reactions, and elementary particles. Modern physics investigations are performed in the laboratory. *Prereq: SP327 and SP351; Coreq: SP352.*

SP327 Twentieth Century Physics (3-0-3). A study of the development of physics in the twentieth century, with particular attention given to relativity theory, quantum theory, and atomic physics. *Prereq: SP222 and SP226 or approval of department chair.*

SP333 Physical Mechanics II (4-0-4). An intermediate course in physical mechanics for physics majors. Newtonian, Hamiltonian, and Lagrangian mechanics with special emphasis on the central force problem and noninertial reference frames. *Prereq: (SP221 or SP211) and SM212.*

SP342 Electricity and Magnetism II (4-0-4). An intermediate course in electromagnetic theory for physics majors. Maxwell's equations are formulated in the notation of vector analysis and applied to various situations. *Prereq: SP351 or SM311.*

SP350 The Physics of Motorsports (3-0-3). The Physics of Motorsports is an elective course open to all majors. Students will apply general physics and calculus to the technical aspects of Motorsports with a focus on parameters that affect performance. For example, real world torque data will be used to estimate accelerations as well as 0-to-60 mph and quarter-mile times. Students will study authentic road course data and compare them to the results of tire and suspension modeling and explore the physics of high performance driving. One day per week is devoted to student presentations on topics of interest. The course will culminate in group projects and presentations. *Prereq: SP211.*

SP351 Problem Solving Methods I (3-0-3). A course in the techniques of mathematics for physics with special emphasis on applications for intermediate mechanics. The course includes a detailed examination of coordinate systems, differential equations, infinite series, Fourier series; linear algebra, introduction to vector spaces; vector calculus and additional topics chosen from geometry and special applications in physics. *Prereq: SM212; Coreq: SP212 or SP222.*

SP352 Problem Solving Methods II (3-0-3). A course in the techniques of mathematics for physics with special emphasis on applications for electromagnetism and quantum mechanics. The course includes applications of vector calculus, the Fourier transform, complex vector spaces, linear transformations, boundary value problems, special functions and additional topics chosen from among numerical methods, statistics and special applications in physics. *Prereq: SP351.*

SP411 Underwater Acoustics and Sonar (3-0-3). A fundamental study of sound propagation in the ocean environment as it relates to the design and operation of sonar. Topics include wave mechanics, detection theory, Fourier analysis, ray tracing, waveguides, and scattering. *Prereq: SP212 or SP226.*

SP425 Advanced Quantum Theory (3-2-4). Advanced techniques for describing quantum systems. Topics covered are quantum mechanics formalism, techniques for solving the Schroedinger equation, perturbation theory, the real hydrogen atom, and angular momentum algebra. The laboratory focuses on building experimental skills through advanced experiments. *Prereq: SP324 and SP352.*

SP434 Nuclear Physics (3-2-4). A study of the basic static and dynamic properties of the nucleus and of the interaction of particles and radiation with matter. Emphasis on the experimental techniques. Where appropriate, quantum mechanical interpretations of the phenomena are given. *Prereq: SP324, SP342.*

SP436 Acoustics (3-2-4). An introduction to modern acoustics. Topics include vibration and normal modes; coupled oscillators; discrete Fourier transforms; radiation, transmission and detection of sound waves; electroacoustics; physical acoustics, architectural acoustics, musical acoustics and sonar. *Prereq: (SP212 or SP226) and SM212.*

SP438 Optics (3-2-4). An introduction to modern optics. Topics include polarization, interference, coherence, diffraction, Fourier transforms, holography, optics of solids and basic laser physics. *Prereq: SP342.*

SP442 Solid State Physics (3-2-4). An introduction to the physics of condensed matter. Topics include crystalline and noncrystalline solids, band theory, semiconductors, magnetism, and superconductivity. *Prereq: SP324 or approval of department chair.*

SP444 Thermal Physics (3-0-3). A presentation of topics in thermal properties of matter and radiation as derived from the laws of quantum mechanics and statistics. *Prereq: SP324.*

SP445 Astrophysics I (3-0-3). A study of the physics of astronomical objects such as stars and galaxies. *Prereq: SM212 and (SP301 or SP324) and (SP310 or approval of director of astrophysics track).*

SP446 Astrophysics II (3-0-3). This course is a continuation of SP445 (Astrophysics I). It is designed for the first-class astrophysics-track. Students explore the current understanding of extragalactic astrophysics and cosmology. In particular, they study the structure and dynamics of various galactic types, the large-scale structure of the universe and the origin and fate of the universe itself. *Prereq: SP445.*

SP447 Observational Astrophysics (2-2-3). This laboratory course is designed to give students hands-on experience with the techiques of modern astrophysical observation, data analysis and interpretation. Observations are made with instruments ranging from binoculars to optical and radio telescopes, and detectors ranging from the human eye and cameras to state-of-the-art charge coupled devices. These data, as well as observations available on-line, are reduced with modern analysis methods, with particular emphasis on image processing. A variety of projects explore the major observational fields of astrometry, photometry, spectroscopy and imaging, and how they provide our fundamental knowledge about the Universe. *Prereq: SP310.*

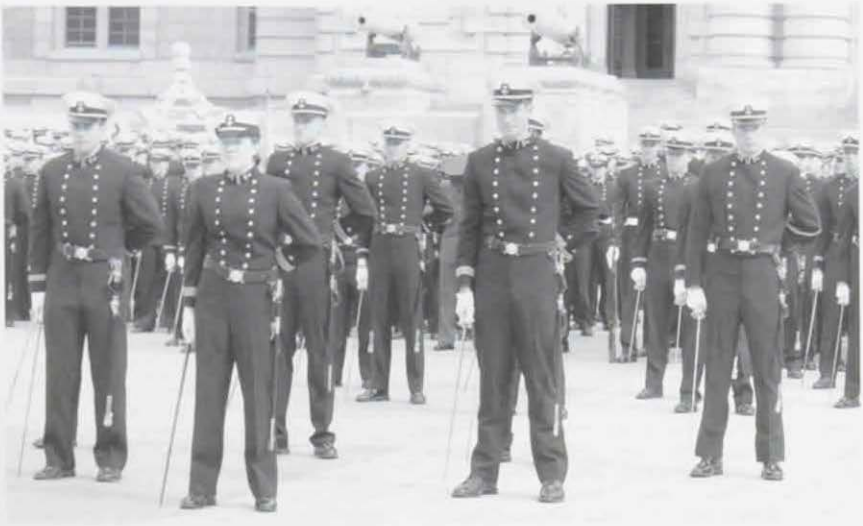
Division of Officership Development

The Division of Officership Development prepares midshipmen to be leaders of character who, upon graduation, serve as warriors, standard bearers of the naval profession, and servants of the nation. The courses offered by its academic department, Leadership, Ethics and Law, complement the training and experiences that develop honor, character, and integrity in midshipmen. The integrated programs of the Division of Officership Development are designed to develop officers who posses the personal attributes, professional knowledge and skill, and strong sense of duty needed to lead and excel in the Navy and Marine Corps.

Leadership, Ethics and Law Department

Officership Development Department

Honor Department



The challenge to our country on the seas today is greater than ever before in our history, and only highly motivated, well educated and thoroughly trained young men and women will be capable of helping our Navy to answer the challenge.

VICE ADMIRAL WILLIAM P. MACK, CLASS OF 1937 *and Superintendent, U.S. Naval Academy, 1972-75*

Leadership, Ethics and Law Department

The Leadership, Ethics and Law Department in the Division of Officership Development of the U.S. Naval Academy provides midshipmen with comprehensive, relevant, and quality education and training in core courses in leadership, ethics, character, and law, and the opportunity to study specialized electives in philosophy, behavioral science, leadership, and law. While the course of study is intentionally broad, it enhances the effectiveness and credibility of midshipmen while they are members of the Brigade, and later when they enter the fleet as junior officer leaders. Through an intensive four-year process, students acquire a solid foundation in the science and art of leadership, preparing them for a lifetime of leadership and service to their country.

The approach to studying leadership at USNA is based upon an experiential learning model comprised of conceptualization, experimentation, reinforcement, and reflection over a period of four years in residence at USNA. Through a process of personal learning, classroom instruction, and interaction, complemented by the unique professional experiences and opportunities for reflection during the academic year and through summer training, midshipmen will understand leadership and what it means to be a Leader of Character. The leadership education program consists of formal instruction by military and civilian professionals in leadership, philosophy and ethics, human behavior, and law; complemented by the practical knowledge and real-time fleet experiences of Navy and Marine Corps leaders. This relevant and effective combination of academic and professional expertise profoundly enhances the learning environment. The "deckplate" experiences of the instructors transforms the learning environment from an abstract study into a more pertinent and timely application of knowledge.

During the four-year program, midshipmen study leadership, human behavior, ethics, law, and character, as well a individual, group, and organizational behavior. In these courses, they gain an understanding and appreciation of the values, culture, identity, and specialized knowledge encompassed by the naval profession.

Leadership, Ethics and Law Courses: NL110, NE203, NL310, NL400

The following courses are offered as electives: NL200, NL211, NL230, NL306, NL311, NL312, NL335, NL420, NL430, NL435, NL440, NL450, NP230, NP232, NP250, NP336, NP340 and NP410.

Leadership, Ethics, Law, and Psychology Courses

Core Courses

NL110 Preparing to Lead (2-0-2). Principles of Self Leadership and Organizational Dynamics. Midshipmen examine fundamental tenets of leadership in the context of the theories and principles of individual and group leadership during their first semester. Topics include self leadership, self management, and team leadership, as well as a seminar with First Class Midshipmen. The course instructors provide relevant personal and Fleet based examples and emphasize interactive learning. *Prereq: 4/C standing.*

NE203 Ethics and Moral Reasoning for the Naval Leader (3-0-3). This course is structured around classical and contemporary writing in moral philosophy. Current and historical case studies are used to show how these fundamental ideas can be applied to the service of the professional military leader. *Prereq: 3/C standing.*

NL310 Leadership: Theory and Application (3-0-3). Students examine the theory and research of the contingent and dynamic process of leadership. Students refine and further develop their understanding of personal strengths, values, and growth opportunities in the context of team, group, and organizational leadership, as well as through the creation of a leadership vision and professional development plan. The course combines literature from the fields of social psychology, organizational behavior, and group dynamics to help students understand the factors that influence leadership in a military context. *Prereq: 2/C standing.*

NL400 Law for the Junior Officer (2-0-2). This course provides a broad survey of military law applicable to the junior officer. Students examine operational law concepts including the Law of Armed Conflict and the Law of the Sea. This course also explores a variety of military justice topics including constitutional issues such as search and seizure and self-incrimination, judicial and non-judicial forums and the administrative separation of enlisted service members from the Navy and Marine Corps. *Prereq: 1/C standing or permission of department chair.*

Elective Courses

Leaderhips, Psychology and Sociology Electives

NL200 Human Behavior (3-0-3). An introduction to the science of psychology, this course covers the theories and principles of individual and group human behavior. Topics include learning, personality, social psychology, memory, human development, brain-functioning, health psychology and psychopathology. This course emphasizes research-based discoveries in the field of psychology. Students are prepared to critically evaluate behavioral science research and apply salient principles to leadership. *Prereq: none.*

NL211 Social Psychology (3-0-3). This course focuses on human behavior in the social context. How individuals influence and are influenced by groups, as well as the field of group dynamics will be examined. Emphasis is placed on research-based findings in the areas of causal attribution, social perception, interpersonal attraction, attitudes and attitude change, group dynamics, prosocial behavior and aggression. Particular emphasis is given to application in the military setting. *Prereq: none.*

NL230 Introduction to Sociology (3-0-3). Sociology is the scientific study of society and the interactions among human beings. The purpose of this course is to provide a survey of the field of sociology and educate and inspire Midshipmen to examine contemporary situations that involve social interaction. Students will use sociological concepts, theories, and research to explain what is taking place, identify social threads and patterns across the situations, and determine the personal as well as the social significance of the analysis. Sociology demands that the student transcend the taken-for-granted, subjective world view and develop a sociological imagination by revealing the linkages and relationships among social facts and connect public issues to self awareness. Students will engage in the identification of common threads across social situations and determine the self and social significance of facts. The teaching and learning strategy involves reading, writing, discussions, presentations, and other active-learning, hands-on projects. Particular emphasis is placed on understanding the basics of the field, to include micro, macro, and meso applications. *Prereq: none.*

NL306 Personality (3-0-3). This course offers an exploration of major influences on the development of personality from both theoretical and clinical perspectives. Theories covered include psychoanalytic, behavioral, cognitive, humanistic and biopsycosocial. This course addresses contemporary research and practice relative to assessment and understanding of personality traits, styles and disorders. Midshipmen will examine their own personality assets and liabilities and implications for leadership. *Prereq: NL 200.*

NL311 Psychology of Leadership (3-0-3). This is an intensive and experientially-focused course that emphasizes leader self-analysis and skill development. Areas covered include personnel management, team development and performance enhancement at both individual and group levels. Research findings from industrial/organizational consultation, learning, motivation, social behavior, group dynamics, personality, counseling, social perception and interpersonal influence will provide the undergirding for developing knowledge, attitudes and skills which contribute to effective leadership. *Prereq: none.*

NL312 Abnormal Psychology (3-0-3). Explores the origins, symptoms, diagnosis and management of psychological disorders. Midshipmen gain an understanding of the root causes of psychological disturbance, including personality disorders. The cognitive, emotional, behavioral and cultural manifestations of these disorders are explored. Strategies for effective prevention and management of psychopathology in operational environments are addressed. Midshipmen also learn techniques for rapid assessment and triage of psychiatric crises. *Prereq: none.*

NL335 Armed Forces and Society (3-0-3). This course examines the American military as a social institution using sociological concepts, theories, and methods. The internal organization and practices of the armed forces and the relationships between the military and other social institutions comprise the field of study. To understand the armed forces and their place in society it is necessary to consider forces, past, present and future, that influence and shape the military. Topics include: military culture and socialization; race and gender, recruiting and retention; changes in military organization; marriage and military families; warfare, technology, and the media. *Prereq: NL230 recommended.*

NL420 Communicating as a Leader (3-0-3). This course examines how leaders use verbal, nonverbal, written, and visual communications to convey their vision and influence both their seniors and subordinates. The students will study interpersonal communication theory, analyze the communications techniques and styles of historical leaders, interact with guest speakers, assess technological aids to communication, and gain practical experience through assigned projects. *Prereq: NL310.*

NL430 Leadership in Groups and Organizations (3-0-3). This course investigates models of leadership drawn from military sociology and organizational behavior. It provides an overview of the critical scholarship on how large, complex, formal organizations like the Navy function and examines the leadership process within such organizations. Topics include group formation and performance, organizational culture and change from the perspective of junior leaders, and the challenges and imperatives of leadership under changing organizational circumstances. *Prereq: none.*

NL435 Introduction to Military Sociology (3-0-3). This course examines the military as a social institution. It uses sociological concepts and methods to analyze both internal organization and practices of the armed forces and the relationships between the military and other social institutions. Though the course focuses on the American military and its relationship to American society, it also investigates the armed forces of other nations to understand some alternative means by which societies organize and relate to their military organizations. *Prereq: NL230 recommended.*

NL440 Experiential Leadership (0-6-3). Experiential Leadership provides a supervised, self-selected opportunity to experience, reflect, conceptualize and deepen an understanding of leadership in an applied context. The course seeks to extend and complement the student's understanding of leadership by leveraging coursework completed at USNA (e.g., NL110, NE203, NL310) with a focused and professionally guided real-world experiential activity outside of the Naval Academy. Various military and civilian-based internships are available; however, the exact nature of the experiential activity will be developed and coordinated with a designated

faculty mentor/sponsor. Midshipmen enrolled in the course undertake a commitment to research, scope, and gain faculty approval of a learning plan with specific objectives before the experiential experience begins; communicate regularly with their faculty mentor during the experience in order to focus reflection and understanding; continually seek out challenges and active participation opportunities during their experiential activity; record (log) their experiences as they pertain to their learning plan objectives and deliver a major paper and presentation following their return which meets the approved learning plan objectives. *Prereq: NL310 and permission of department chair.*

NL450 Race, Gender, and Ethnicity (3-0-3). This course investigates the social and physical constructs of race, gender, and ethnicity in the context of social inequality in America. Particular emphasis is placed on understanding how these constructs, both singly and in combination, affect American society and culture. The course examines how the social institutions of marriage and families, work and employment, education, media, and the state create and maintain inequalities. Marxian and conflict theories, Weber's multidimensional model, and the structural-functionalism of Durkheim and Talcott Parsons are covered in depth. Application of key concepts, principles, and theories to the American military and Naval Service is a cornerstone of this course, as is the understanding of cultural diversity. Upon completion of this course, the successful student will possess a stronger and broader understanding of how social stratification affects American society, and how this stratification contrasts with stratification systems in other societies. *Prereq: NL310, NL230 recommended.*

Philosophy Electives

NP230 Introduction to Philosophy (3-0-3). An introduction to philosophy through close study of one or more classic works of philosophy, with an emphasis on examining philosophical conceptions of leadership. In recent semesters, these have included Plato's Republic (and other dialogues of Plato), Descartes' Meditations on First Philosophy, Kant's Prolegomena to any Future Metaphysics and historical essays (including "Perpetual Peace"), Nietzsche's Beyond Good and Evil, and selections of essays on political and military leadership by Plutarch, Machiavelli, Locke, Hegel, Kierkegaard, and other modern and contemporary philosophers. The emphasis of the course is on careful reading and analysis of the text, and on seminar discussion among the class participants (what Plato described as "dialectic" and reckoned in the Republic to be among the chief prerequisites for sound military and political leadership), together with several substantial writing assignments, and written mid-term and final examinations. *Prereq: none; Coreq: NE203.*

NP232 Military Ethics: The Code of the Warrior (3-0-3). Why do warriors fight? How do they fight? What should bring a warrior honor? What should bring them shame? What is really worth dying for? There have been special warrior cultures in countless societies across the globe, through every era in history. Were these warriors just killers, or did they have their own unique codes of behavior? This course explores several warrior traditions: the Ancient Greeks, the Vikings, the Romans, the Celts, Knights and Chivalry, African Tribesmen, Native American Warriors, Chinese Warrior Monks, Japanese Samurai, and 20th century warriors, and applies the lessons of their experience and warrior philosophy to the task of creating the ideal code for warriors of the new millennium. *Prereq: none.*

NP250 Introduction to Logic (3-0-3). Logic is the study of arguments and their structure, including the identification of possible mistakes or errors in reasoning ("logical fallacies") and the manner in which these may lead us astray in public discourse. Most importantly, logic enables us to spot these errors and correct for them, as well as avoid them in our own reasoning. In this introductory survey, we will examine the role of language and rhetoric in constructing arguments and introducing errors, how to replace language with symbols in so-called "propositional logic" in order to analyze the structure of arguments more carefully, and how to recognize a number of famous "informal" fallacies that frequently arise in public discourse. Finally, we will discuss common strategies of reasoning, like analogy and induction, that are used frequently in scientific, engineering, legal, and applied moral reasoning to frame problems and search for adequate solutions. *Prereq: none.*

NP336 Philosophy of Religion (3-0-3). This class provides a focused introduction to philosophical questions that arise about religion and in the pursuit of religious ideals. Whether you are a person of strong faith from any religious tradition or an agnostic or an atheist, you will enjoy investigating and debating questions and topics such as these: Arguments for the Existence of God, Do Miracles Occur?, What is the Source of Evil?, What Happens When We Die?, Faith and Reason, Faith and Scientific Knowledge, Religious Pluralism, and the Relationship Between Religion and Ethics. One way or another, these issues affect us all. *Prereq: 2/C standing or permission of department chair.*

NP340 Philosophy of Science (3-0-3). Everyone learns science from textbooks and tried-and-true lab experiements, but do you know how scientists really work? How they decide to count only certain things as "facts," and to regard only certain theories as "knowledge?" How they struggle to eliminate the subjective factor that is present in all human inquiry, in order to discover objective truths? In this course you will examine these intriguing issues by reading some classic works of philosophers, historians, and sociologists of science; by comparing the process of knowledge-generation in science with the analogous processes in other fields and in everyday life; and by actually performing your own social-scientific study. Leave behind the popular myths and stereotypes about scientists, and find out how their world really works. (Required of general science majors). *Prereq: 2/C standing or permission of department chair.*

NP410 Philosophy of War (3-0-3). This course will begin with a careful philosophical analysis of the concept of war and then proceed to a critical investigation of its moral permissibility. In so doing, we will consider such questions as: what distinguishes war from other forms of violence and coercion; whether offensive or defensive wars are ever justified; whether the use of military force for humanitarian ends is legitimate; what weapons, tactics and strategies may be employed in fighting a war, and against whom may such weapons, tactics and strategies be used? *Prereq: NE203.*

Other Courses

NL313 Psychology of Crime (3-0-3). Why do individuals commit crimes? Is the impetus genetic, environmental or a matter of free will? This course explores the biological and behavioral origins of criminal activity in society and examines how the justice system deals with such behavior. Special consideration is given to mentally ill defendants and use of the insanity defense. Students conduct case studies to diagnose the pyschological and behavioral bases of criminal conduct in mock defendants, to recommend appropriate punishments and treatment and to assess rehabilitative potential. *Prereq: NL200; Coreq: NL400.*

NP335 Comparative Study of Religion (3-0-3). This course is designed as an introduction to the study of religion through the examination and comparison of concepts and themes central to human cultures. Examples are drawn primarily from the ancient Near East (including ancient Israel and Iran), China, Japan, classical Greece and Rome, Southeast Asia, the Americas, Eurasia, Judaism, Christianity, Zoroastrianism, Buddhism, Manichaeism, Islam, Hinduism, and contemporary non-literate cultures. Students are challenged to think in broad comparative terms, bringing together both details and generic categories. *Prereq: none.*

NP420 Philosophical Foundations of Liberty (3-0-3). Most of us believe that liberty is an important value. Indeed, many of us believe that it is the most important moral value. But we often do so without stopping to consider what liberty is and why we think it is so important. For example, is liberty the absence of something (interference) or the presence of something (control); is liberty something one necessarily wants more of or are there times when one might want less; can constraints on one's liberty be liberating or are they always limiting; should one be permitted to give up one's liberty or should one be forced to be free; does a commitment to individual liberty require a commitment to free markets or is a commitment to individual liberty compatible with other types of economic arrangements? Furthermore, what is the relationship between liberty and other things we value such as justice, equality, security, community, happiness and responsibility? Through the reading of classical and contemporary texts, this course will examine these and other related questions, not with the intent of achieving a final resolution, but with the intent of providing the student with a framework to thoughtfully consider and evaluate the relevant philosophical and moral issues. Emphasis throughout will be on class participation together with weekly writing assignments. Both a written mid-term and final examination will be given. *Prereq: NE203.*

Division of Professional Development

The Division of Professional Development prepares midshipmen to be professional officers in the naval service. The courses offered by its academic department — Seamanship and Navigation — develop skills in the classroom environment, on the water, in yard patrol training craft and in the academy's tactical training facilities. Through the Professional Programs Department each midshipman moves out of the classroom to experience life at sea with operational fleet units.

Seamanship and Navigation Department

Professional Programs Department

Seamanship and Navigation Department

The Seamanship and Navigation Department provides midshipmen with the skills necessary to be an impact player in the fleet. The department's core curriculum spans all four years at the Naval Academy and is designed to provide a solid theoretical foundation, reinforced through summer training cruises.

Professional Programs Department

The Professional Programs Department is responsible for two programs that directly affect midshipmen: Summer Training and Career Information Program (CIP)/Service Assignment.

The Summer Training Program encompasses the assignments and logistics behind the dozens of activities that midshipmen participate in on the Yard as well as those to the many Fleet units all around the world. It is the goal of Summer Training to expose midshipmen to Fleet units in all warfare communities in order to enhance their professional knowledge and allow them to make informed decisions regarding their eventual Service Assignment.

The Career Information Program (CIP) is designed to make as much information as possible available to the midshipmen regarding the opportunities available in the different communities upon graduation. This is done through briefs, social events and discussions of current trends in the Navy with junior officers from the different warfare specialties.

The culmination of CIP is the Service Assignment process, by which midshipmen are assigned to their respective warfare communities. Professional Programs serves as the liaison with the Bureau of Personnel to ensure the Naval Academy is providing capable officers to satisfy the current and projected needs of the Navy and Marine Corps.

Seamanship and Navigation Courses

NN101 Introduction to Navigation (1-2-2). A comprehensive introduction to Basic Navigation concepts, voyage planning, general meteorology, and contact tracking on maneuvering boards. The course objective is to demonstrate the practical use of the navigation chart by introducing the student to the chart format, plotting tools, and plotting techniques which include chart coordinates, distance and direction measurements such as speed, time, and distance calculations. Reinforces Navigation Rules and ship handling skills learned in NS101. Includes at-sea labs on 108' Yard Patrol (YP) Craft and shore-based bridge simulator labs, providing midshipmen hands-on experience navigating in and out of harbors. Must be completed before participating in CSNTS or LANPATRAMID. *Prereq: none.*

NN200 Navigation and Piloting (1-2-2). This course builds upon the foundation of navigation and seamanship skills established in NS101/NN101 and honed while at-sea during Third Class summer training cruise. Reinforces piloting skills through practice in ship handling simulators and 108' Yard Patrol (YP) Craft and introduces students to the principles of celestial and electronic navigation, weather for the mariner, tides and currents, and voyage planning. *Prereq: NN101.*

NS101 Fundamentals of Seamanship (1-2-2). This course provides the basic maritime background in general ship characteristics, ship handling, and International and Inland Navigational Rules (i.e. Rules of the Road). Includes at-sea labs on 108' Yard Patrol (YP) Craft where midshipmen gain hands-on ship maneuvering experience and practical application of the Navigation Rules. Must be completed before participating in CSNTS or LANPATRAMID. *Prereq: 4/C standing.*

NS300 Naval Warfare (0-2-1). Naval Warfare is an introduction to naval doctrine and the tactical decision making factors that influence warfare planning and operations. Warfare areas examined throughout the course include: Surface, Undersea, Air, and Ground. Meeting once per week for a total of 2 hours, the student will attend lectures, along with ship handling simulators and 108' Yard Patrol (YP) Craft labs, culminating in a final exercise case study analysis. *Prereq: 2/C standing or physics major or approval of department chair.*

NS421 Junior Officer Practicum (Surface Restricted Line) (0-2-1). A course to provide information on the duties and responsibilities required of a junior officer in the surface community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the surface force, as well as an introduction to the Division Officer at Sea qualification process. Labs include training in shiphandling and bridge watchstanding skills through the use of YPs and simulation software. *Prereq: 1/C standing.*

NS422 Junior Officer Practicum (Submarines) (0-2-1). A course to provide information on the duties and responsibilities required of a junior officer in the submarine community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the submarine force. Lab includes training in shiphandling through use of Yard Patrol (YP) craft. *Prereq: 1/C standing.*

NS423 Junior Officer Practicum (Naval Aviation) (0-2-1). A course to provide information on the duties and responsibilities required of a junior officer in the aviation community. Instruction includes descriptions of the aviation training pipeline, aviation preflight indoctrination, various naval aviation communities, squadron organization, division officer responsibilities, Naval Aviation Safety and Operating Procedures (NATOPS), and aircrew coordination training. Offered in a lab format, this course provides for mentorship, aviation guest speakers and practical research work within the aviation community. *Prereq: 1/C standing.*

NS424 Junior Officer Practicum (Marine Corps) (0-2-1). A course to provide information on the duties and responsibilities required of a junior officer in the Marine Corps. Instruction includes, among other things, tactics, techniques, and procedures of the Marine Corps; organizational structure and operational procedures; and practical applications of leadership principles tailored to the Marine Corps' Operating Forces. Particular emphasis will be placed on combat and tactical decision making to develop and enhance the students' critical thinking ability, analytical skills, and bias for action. Additionally, all concepts will be reinforced through demanding physical fitness routines designed to challenge the student physically as well as mentally. *Prereq: 1/C standing.*

NS425 Junior Officer Practicum (Special Warfare) (0-2-1). A course to provide information on the duties, responsibilities, and challenges facing a junior officer in the Naval Special Warfare (NAVSPECWAR) community. This course introduces students to the existing NAVSPECWAR command structure, capabilities and future trends, the intricacies of small unit mission planning, land navigation, SEAL swimming skills, weapons-handling, administrative responsibilities, reviews of pertinent historic case studies, and analyses of decision making. Labs include instruction in small unit tactics, small boat handling skills, various outdoor training activities, and guest lecturers from the Special Operations Community to discuss leadership as a junior officer. *Prereq: 1/C standing.*

NS426 Junior Officer Practicum (EOD) (0-2-1). A course to provide information on the duties and responsibilities required of a junior officer in the special operations/EOD community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the surface force. Practical exercises include dive locker training, underwater training and small boat handling skills in preparation for Dive School. *Prereq: 1/C standing.*

Academy-Wide Seminars, Research Projects and Interdisciplinary Courses

Academic departments may offer seminars and individual research projects to upperclassmen on the following basis:

Seminars:

XX 481 and XX 482	1-0-1
XX 485 and XX 486	3-0-3 Advanced topics

Research projects:

A creative project in the student's field of interest. A faculty adviser must approve and monitor each project. *Prerequisite: described in an instruction of the Academic Dean and Provost.*

XX 491 and XX 492	0-2-1
XX 493 and XX 494	0-4-2
XX 495 and XX 496	0-6-3

Note: XX represents the departmental designator.

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Athletics

Just as the Naval Academy promotes the professional and intellectual development of midshipmen, so also must it fulfill its responsibility for each midshipman's physical development. This is met through an intercollegiate sports program that is one of the broadest in the nation—19 men, 11 women and two co-ed—and an equally ambitious intramural and club sports program. All midshipmen are required to participate in these programs, either at the varsity, intramural or club level.

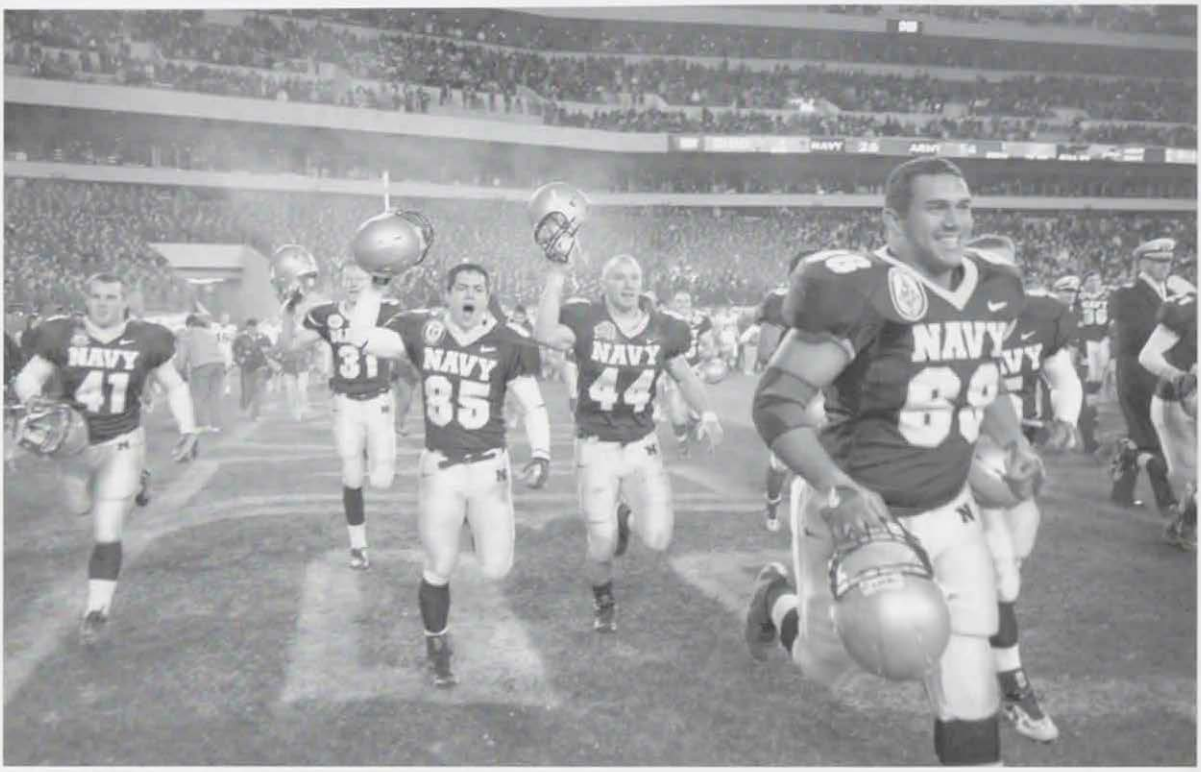
Athletics play a major role in how we accomplish our mission. We challenge midshipmen physically so that when they graduate they will be prepared to successfully lead in combat. We want our future officers to be team builders and learn how to motivate others to excel. We want them to compete on the athletic field and win. In order to win our midshipmen must set high goals for themselves and their team and find a way to meet them. Our hope is that by the time they join the Fleet and Corps as junior officers, they have learned not only what teamwork, determination and leadership mean—but how they transcend to succeeding in combat. Developing midshipmen physically is also about hard work, stamina and physical and mental toughness. Aggressiveness, perseverance and toughness in the face of adversity are qualities we want them to demonstrate as second nature.

The roll call of varsity "N" winners at the Naval Academy reads like a veritable Who's Who in America—Rear Admiral Alan B. Shepard, the first American in space and a member of the heavyweight crew; Admiral Stansfield Turner, ex-football lineman who became director of the Central Intelligence Agency; Admiral Arleigh Burke, a wrestler who later was Chief of Naval Operations; Rear Admiral Richard Byrd, the polar explorer who captained the Navy gymnastics team; Fleet Admiral Chester Nimitz, also a former Navy oarsman; Fleet Admiral Bull Halsey of World War II fame, a football player at the Academy, Heisman Trophy winners Joe Bellino and Roger Staubach, and the basketball star David Robinson.

At the Naval Academy, all midshipmen actively participate in competitive sports, either at the intercollegiate, club or intramural level.

Over the years, Navy teams have been successful in both national and international arenas. Midshipmen football teams have participated in the Rose, Sugar, Cotton, Orange, Holiday, Liberty, Aloha, Houston, Emerald, Poinsettia and Meineke Car Care Bowls. Navy's football rivalry with Army is one of the greatest college football rivalries.

In 2007-08, Navy sports teams compiled a record of 315-157-7 (.665). The 315 wins and the .665 winning percentage are the best marks in school history. Navy produced a school record 27 All-Americans, 12 Conference Athletes of the Year and won a school record 12 different conference championships. The football team posted a 8-5 record, won a school-record fifth-consecutive Commander-in-Chief's Trophy and participated in a school-record fifth consecutive bowl game. Navy has dominated the other two service Academies, winning 11 straight games against Air Force and Army.



I just wanted to motivate people to do things even when I was exhausted as a leader. Motivation and teamwork are things I learned from football.

Midshipman Rashawn King,
Class of 2009

King is a cornerback on the Navy football team who worked as a detailer indoctrinating a squad of 11 plebes on how to become a midshipman this past July.

Intercollegiate Athletics

The Naval Academy's intercollegiate athletics program is administered by the Naval Academy Athletic Association, a private non-profit corporation. The Association is chartered so that the Academy can offer intercollegiate athletics at no expense to the federal government. The athletic association arranges varsity schedules and provides coaching staff and equipment, and funding for the varsity athletic program.

The Naval Academy is a Division I college and a member of the National Collegiate Athletic Association. Its primary conference affiliation is with the Patriot League, a group of highly selective colleges whose motto is, "today's scholar-athletes, tomorrow's leaders." Full members of the League are American, Army, Bucknell, Colgate, Holy Cross, Lafayette, Lehigh and Navy. Several sports, including swimming, sailing, rowing and gymnastics have affiliations in addition to, or outside the Patriot League. For example, football is a Division 1A independent team that regularly plays Army, Air Force and Notre Dame, in addition to an intersectional schedule that frequently includes teams from the Atlantic Conference and Big East Conferences.

Men's Varsity Sports
Baseball
Basketball
Crew, heavyweight
Crew, lightweight
Cross country
Football
Golf
Gymnastics
Lacrosse
Rifle
Soccer
Sprint Football
Squash
Swimming & Diving
Tennis
Indoor Track
Outdoor Track
Water polo
Wrestling

Women's Varsity Sports
Basketball
Crew
Cross Country
Lacrosse
Intercollegiate Sailing
Soccer
Swimming
Indoor Track
Outdoor Track
Tennis
Volleyball

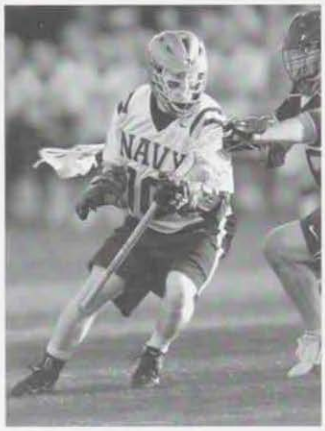
Co-Ed Sports
Intercollegiate Sailing
Offshore Sailing

Director of Athletics

Chet Gladchuk became the 28th Director of Athletics at the Naval Academy in September 2001. Gladchuk held posts as athletic director at the University of Houston, Boston College University and Tulane University. A graduate of Boston College, Gladchuk was a letter winner in football. He earned a master's in sports administration from the University of Massachusetts-Amherst.

"At the Naval Academy, the athletic program is not just an extracurricular activity, it is part of the mission and as such receives a priority much different than at a civilian school. The athletic teams are an integral part of the overall education of a total person. Athletics provide leadership opportunities, and the experiences of team play, cooperative effort, sportsmanship, commitment and individual sacrifice for goals that some may or may not be able to achieve. Athletics and competition are a big part of every midshipman's life at the Naval Academy. The Naval Academy and the Naval Academy Athletic Association is committed to providing the best possible experience for our student-athletes."

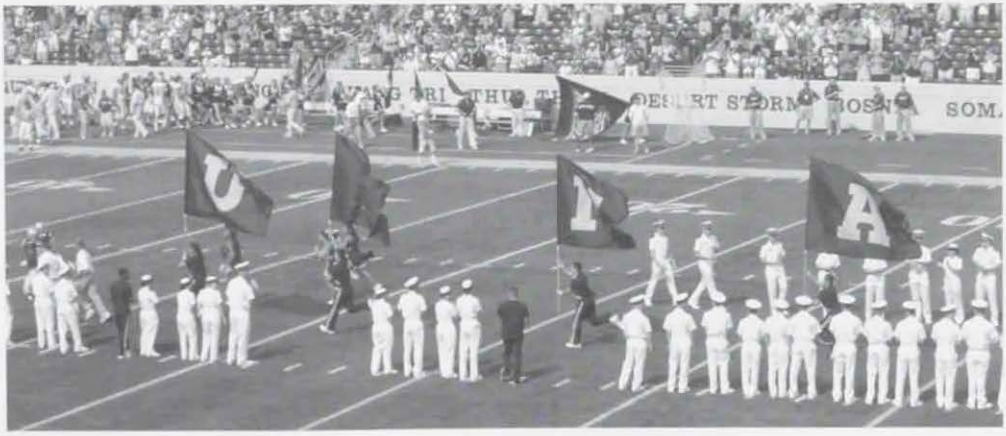
Intramural/Club Sports Programs



The Commandant of Midshipmen organizes an extensive intramural sports program that pits midshipmen companies in athletic competition. These competitions award points to midshipmen companies that help in determining the selection of the Academy's "Color Company" at the end of the academic year. The games are particularly spirited and allow midshipmen to compete at a level appropriate to their individual athletic ability. Company teams compete in a variety of sports.

In addition to the varsity and intramural athletic programs, the Academy offers a variety of opportunities to participate in a very competitive Club Sports program. Most players in this program are former high school athletes who desire to continue playing a sport, or learn a new one, and seek rigorous competition. Although these teams are not sanctioned by the NCAA, they do compete against area colleges. Club sports offered include: boxing, cycling, men's hockey, karate, marathon, pistol, powerlifting, men's rugby, women's rugby, women's softball, women's tennis, triathlon and men's volleyball.

In addition to the varsity and intramural athletic programs, the Academy offers a variety of opportunities to participate in a very competitive Club Sports program. Most players in this program are former high school athletes who desire to continue playing a sport, or learn a new one, and seek rigorous competition. Although these teams are not sanctioned by the NCAA, they do compete against area colleges. Club sports offered include: boxing, rugby, pistol, cycling, karate, men's ice hockey and volleyball, men's soccer and lacrosse, powerlifting, triatholon, women's softball, field hockey, tennis and rugby.



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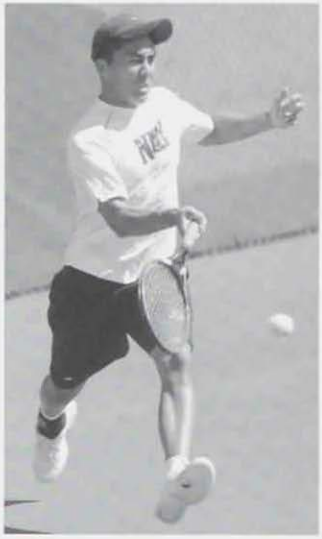

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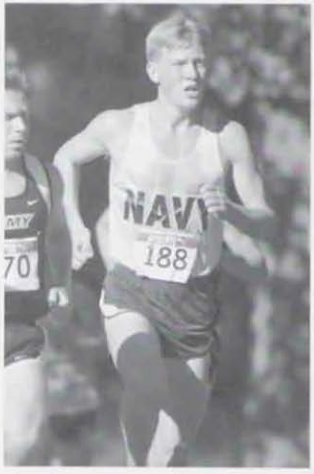
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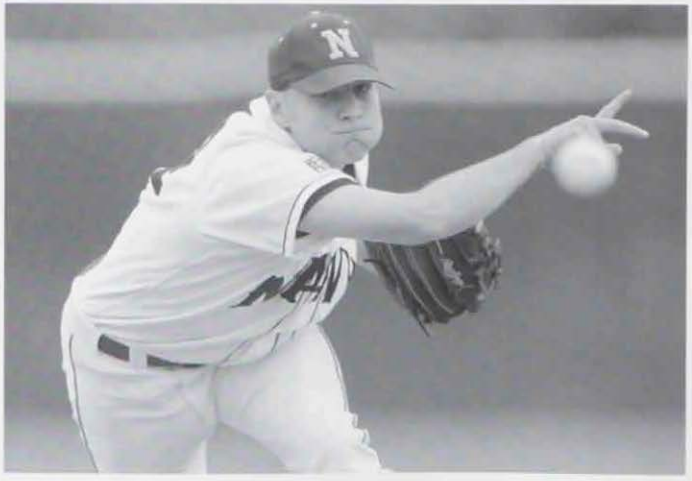
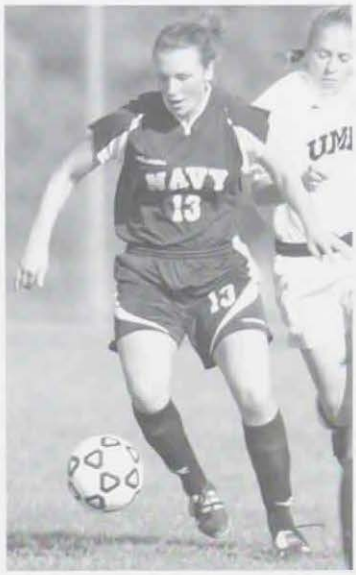


Athletic Facilities

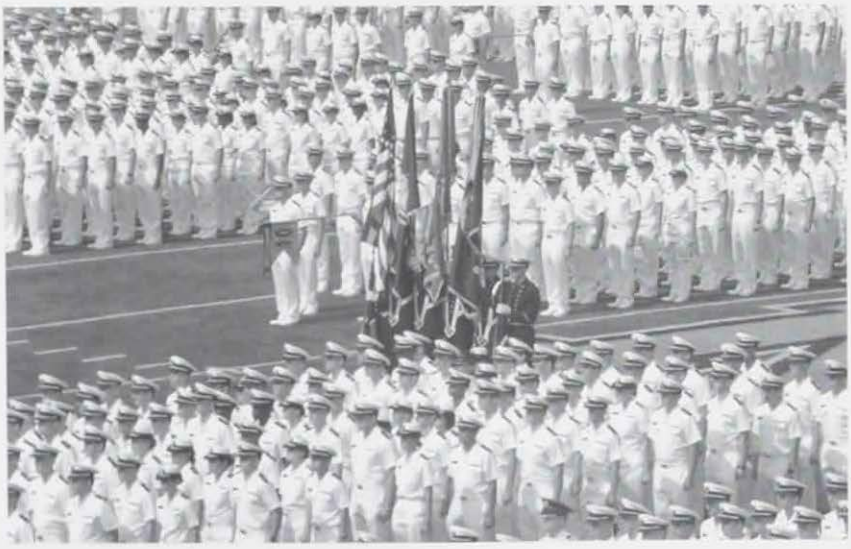
In looking around the Academy, the facilities for intercollegiate and intramural sports, physical education and personal fitness are unsurpassed and not reserved for just a few athletes. All midshipmen have access to these facilities:

- The newly-renovated 34,000-seat Navy-Marine Corps Memorial Stadium
- Alumni Hall, completed in 1991 with seating of 5,710 for athletic contests lectures, assemblies, theatrical productions, concerts and official ceremonies
- Ricketts Hall, with a new and larger football locker room, a modern physical training facility, and an up-to-date 12,000 sq. ft. weight room
- Lejeune Hall, built in 1982, containing an Olympic-sized pool, diving platforms and tank, a wrestling arena and personal conditioning areas
- A 400-meter synthetic-surfaced outdoor track
- Macdonough Hall, with facilities for gymnastics, boxing, volleyball, swimming, water polo, racquetball, basketball and personal conditioning
- Halsey Field House, synthetic-surfaced throughout, includes a 220-yard track, basketball courts, new international squash courts, weight-training facilities, climbing wall and a portable wooden basketball floor
- Hubbard Hall, the home for Navy's crew squads, with the state-of-the-art Fisher Rowing Center
- Rip Miller Field, an all-weather synthetic-surfaced field for football, lacrosse, and soccer
- Max Bishop Stadium, a newly renovated 3,000-seat baseball stadium
- A challenging 6,217-yard 18-hole golf course
- The Glenn Warner Soccer Facility is one of the finest college soccer facilities in the nation. The 16,300 square-foot facility houses the Naval Academy's men's and women's varsity soccer teams.
- Robert Crown Sailing Center, home of the Intercollegiate and Varsity Offshore Sailing Teams, as well as the Command, Seamanship and Navigation Training Squadron.
- The Wesley Brown Field House, a 140,000-square-foot, $52 million structure, houses facilities for physical education, varsity and intramural athletics, club sports and personal fitness. The field house uses the most advanced technology for personal condition and combat preparedness.
- The 155,000-square-foot Brigade Sports Complex features six hard-court surfaced indoor tennis courts and an indoor ice hockey rink.

The Naval Academy Athletic Association arranges varsity schedules and provides coaching staff and equipment, and funding for the varsity athletic program.



It has been interesting to see how far I can really push myself both physically and mentally on days where there are a million and ten things going on and coach gives us a really hard practice. When the school day is over, it's another opportunity to keep pushing myself to see what I've got inside.
—Ensign Fiona Macfarland, Class of 2008



Career Opportunities After Graduation

Recognizing that priorities, goals, and abilities can change a lot in four years, I sought the flexibility to change my mind and still be able to contribute to a greater mission. I found that here.
—2nd Lieutenant Genevieve Studer, USMC
Class of 2008

The Naval Academy devvelops midshipmen morally, mentally and physically to serve as combat leaders of character for our Navy and Marine Corps. Graduation from the Naval Academy brings new opportunities for leadership, learning, professional advancement, travel and excitement. From the very first assignment as an officer in the naval service Naval Academy graduates will have more responsibility and challenge on the job than almost any civilian just out of college. Many of our recent graduates are leaders of sailors and Marines throughout the world on forward-deployed ships, submarines, squadrons, SEAL teams or in Marine units.

Your service commitment begins at graduation, when you are commissioned as an ensign in the Navy or a second lieutenant in the Marine Corps. All physically qualified graduates are commissioned into the unrestricted line of the Navy or Marine Corps. Most midshipmen who graduate but are physically ineligible to serve in the unrestricted line are commissioned in a restricted line or staff corps specialty such as Intelligence, Supply Corps or Civil Engineer Corps.

Service Assignment

The career options available to Naval Academy graduates are the broadest offered by any of the nation's service academies. You can:

- specialize in surface warfare, with assignments aboard ships ranging from guided missile destroyers to amphibious ships deployed in expeditionary strike groups;
- enter the submarine service, with duty aboard nuclear-powered attack and ballistic missile submarines;
- fly a variety of aircraft from helicopters and shore-based patrol planes to supersonic, aircraft carrier-based jet fighters;
- command infantry, armor, artillery or aviation units as a Marine Corps officer; and
- lead the most talented and highly motivated Sailors and Marines in the world, no matter what career path you choose.

Sign on and Sail with me. The stature of our homeland is no more than the measure of ourselves. Our job is to keep her free. Our will is to keep the torch of freedom burning for all. To this solemn purpose we call on the young, the brave and the strong, and the free. Heed my call. Come to the sea. Come Sail with me.
—John Paul Jones

You will be given the opportunity to state your career preference early during your senior year. Actual assignment to that community is based upon the needs of the Navy and Marine Corps, your overall record at the Naval Academy, and personal and physical qualifications.

Surface Warfare

Surface warfare officers serve in every type of surface ship in the Navy. When you are selected for surface warfare, you have the opportunity to choose the type of ship and home port of your first duty assignment. Then, after graduation from the Academy, you report to your ship. Your first tour of duty lasts about 24 months.

A new ensign typically serves as a division officer, with responsibilities for leading 12 to 50 enlisted personnel and directing a portion of the ship's equipment and operations. Typical positions include those of anti-submarine warfare officer, gunnery officer, communications officer and damage control assistant. In addition, you are expected to work toward qualification as combat information center watch officer, officer of the deck and Navy surface warfare officer.

Nuclear Propulsion — Surface

The Navy's demanding and highly technical nuclear power training program is among the best in the world. Those chosen for the program usually rank high in their class and have a solid background in scientific and technical courses, though not necessarily majors in these areas.

Midshipmen who choose surface warfare can join those choosing submarines in pursuing a sub-specialty in nuclear propulsion systems. If you are accepted into the nuclear power program, you report to Nuclear Power School in Charleston, S.C., for six months of schooling following your first division officer tour. You then train for six months at one of several nuclear reactor prototype sites located throughout the country before reporting to your second ship.

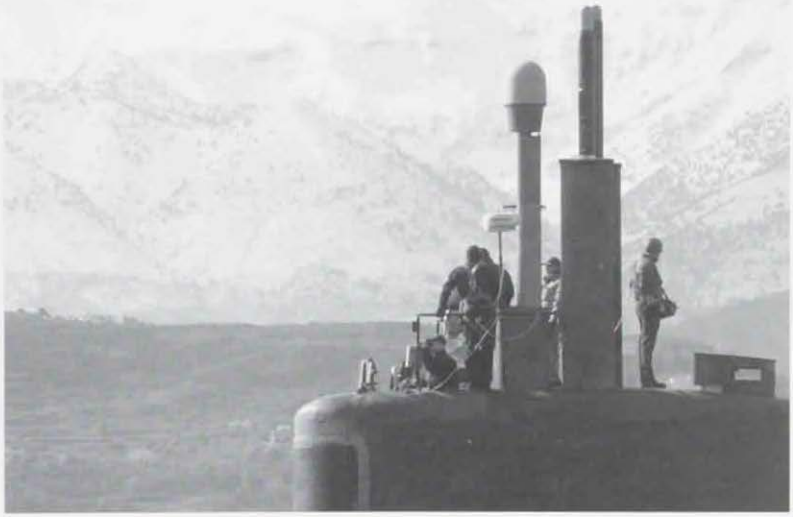
All of the Navy's submarines are nuclear-powered. Most aircraft carriers are nuclear powered and surface warfare officers alternate between these and conventionally powered ships as they advance in their careers.

Submarine Force

Those assigned to the silent service begin by studying Navy nuclear propulsion at Nuclear Power School in Charleston, S.C., for six months of schooling, followed by six months of training at one of several nuclear reactor prototype sites located throughout the country.

You then go to Navy Submarine School in New London, Conn., for the 10-week submarine officers basic course. Your first tour of duty with an attack or fleet ballistic missile submarine lasts about 36 months.

In a nuclear submarine, junior officers lead divisions of 10 to 20 men. You have responsibilities in a vital area of operations such as engineering, weapons or communications. You also stand watches and work to qualify as engineering officer of the watch, diving officer and officer of the deck — all steps towards earning the gold dolphins of a Navy submarine officer.



Knowledge of the oceans is more than a matter of curiosity; our very survival may hinge on it.
—President John F. Kennedy

No man needs sympathy because he has to work, because he has a burden to carry. Far and away the best prize that life offers is the chance to work hard at work worth doing.
—President Theodore Roosevelt

Naval Aviation

Whether landing an F/A-18 Hornet on the deck of an aircraft carrier, conducting maritime surveillance in the Persian Gulf in a P-3 Orion or maneuvering an SH-60F helicopter in a rescue operation, naval aviators are constantly called upon to perform under pressure. When you are assigned this career path, you can select training as a pilot or a naval flight officer. Pilots fly aircraft while naval flight officers serve as weapons systems officers, electronic countermeasures officers and technical coordinators.

After graduation from the Academy, all those choosing aviation report to Pensacola, Fla., for Aviation Preflight Indoctrination. Pilot trainees may either stay in Pensacola or move to Corpus Christi, Texas, for basic flight training. Depending on the type of aircraft/training track chosen after basic, pilots may complete advanced training at several training bases throughout the Gulf Coast. Naval flight officers (NFOs) complete all of their flight training in Pensacola or at Randolph Air Force Base in Texas. Aviators receive their 'wings of gold' after 18-24 months for pilots and 12-18 months for NFOs. They are assigned to their first squadron after six to nine months of aircraft and mission-specific training in a fleet replacement squadron.

In addition to flying, naval aviators have significant leadership and management responsibilities beginning with their very first duty assignment. New officers typically are charged with leading a group of aviation enlisted personnel and overseeing their squadron's operations, administration, personnel management and aircraft maintenance.

A CH-53E Super Stallion helicopter assigned to Marine Medium Helicopter Squadron 165 prepares to land.

Marine Corps

Up to one-sixth of each graduating class may be chosen for commissioning as second lieutenants in the Marine Corps. After graduation from the Academy, you attend the Basic School, a 26-week course for officers at Quantico, Va. This school gives all Marine officers a common background in the tactical study of land warfare. Then you go on to advanced training in a particular occupational specialty based on your qualifications and preferences.

Marine Corps career fields include those in the two basic categories of ground and air. Ground career choices include infantry, armor, artillery, logistics, engineering, communications-information systems, financial management and military police. Aviation choices include pilot, naval flight officer, air command and control, anti-air warfare, aviation maintenance and aviation supply.

In their first assignments, Marine Corps second lieutenants are generally assigned as platoon commanders with leadership responsibilities for 35 to 43 enlisted Marines. You often have a role in a Marine air/ground task force, with Marine light infantry capable of opposing much more heavily equipped forces. Meshing of air and ground officers in these task forces and individual units gives officers the opportunity later to command combined units, not just within career specialties. Marine officers are assigned all over the world.

Among the men who fought on Iwo Jima, uncommon valor was a common virtue.
—Admiral Chester W. Nimitz, Class of 1905

Special Operations and Special Warfare

Special Operations includes: Explosive Ordnance Disposal (EOD), Mine Countermeasures (MCM), Operational Diving and Salvage (ODS), and Explosive Ordnance Management (EOM). Explosive Ordnance and diving provide the common base which assures compatibility of the four functional areas. Special Operations offers men and women an exciting career and command opportunity in a small specialized community.

Special Warfare provides qualified officers the opportunity to be a member of one of the world's elite fighting forces. Navy SEALs (Sea, Air and Land forces) are known and respected around the world.

Restricted Line and Staff Corps Specialties

Midshipmen who are not physically qualified to serve in the unrestricted line but who can be commissioned as active duty officers can choose from a wide variety of alternatives and pursue a career. Restricted line and staff corps officers may choose careers in the fields of intelligence, cryptology, oceanography, medicine, civil engineering, supply and aviation maintenance. They serve aboard ships, with aircraft squadrons and at shore bases around the world. Graduating midshipmen who are accepted to medical school may be commissioned in the Medical Corps even if physically qualified to serve in the unrestricted line.

Assignments for Women

Military service is just that: service. I wanted to protect the values that I hold as the pillars of freedom. At a civilian college, I knew that my time and efforts would be concentrated on myself. I decided I would prefer to focus on doing what I could to support others without sacrificing my own.
—Ensign Genevieve Studer, Class of 2008

For female officers in the Navy and Marine Corps, many options are open to you to serve in assignments vital to our national defense. You may fly planes as a pilot or naval flight officer or serve on combatant ships as a surface warfare officer. Women may also enter restricted line or staff corps specialties such as oceanography, intelligence, supply or civil engineering if not physically qualified for aviation, ships or Marine Corps.

You also may choose to enter the Marine Corps. Women Marine Corps officers can be assigned to all career fields available to male officers, except infantry, artillery and armor.

A very limited number of billets in medicine are available each year to both male and female graduates who are accepted for admission by an accredited medical school.

Career Choices of the Class of 2008

The members of the Class of 2008 chose the following service and warfare specialties to enter after graduation and commissioning:

Aviation:
- Pilot Training — 247
- Naval Flight Officer Training — 87

Surface Warfare:
- Conventional — 232
- Nuclear — 32

Marine Corps: 236

Submarine warfare: 117

Navy Restricted Line and Staff Corps: 22
including men not physically qualified for the unrestricted line duties above, elected specialization in aviation maintenance duty, cryptology, intelligence, supply corps, civil engineer corps and meteorology/oceanography

Medical Corps: 16

Special Warfare (SEAL): 27

Special Operations (diving, salvage and explosive ordnance disposal): 14

Typical Pay and Allowances for Junior Naval Officers

This table shows the approximate pay and allowances of Navy and Marine Corps junior officers. Promotion to Navy lieutenant (junior grade) or Marine Corps first lieutenant normally comes two years after commissioning. The next promotion, to Navy lieutenant or Marine Corps captain, normally comes four to five years after commissioning. All of these figures, including cost-of-living increases, are subject to change.

Monthly Pay and Allowances

	ENS/2nd LT	LTJG/1st LT	LT/CAPT
Base Pay	$ 2,555.70	$ 3,353.10	$ 4,545.60
Subsistence	$ 202.76	$ 202.76	$ 202.76
Housing Allowance*	$ 1,350.00 (single)	1606.00 (single)	$ 1,829.00 (single)
	$ 1,689.00 (family)	$ 1,918.00 (family)	$ 2,136.00 (family)
Sea Duty Pay**	$ 100.00	$ 100.00	$ 225.00
Flight Pay**	$ 125.00	$ 156.00	$ 206.00
Submarine Pay**	$ 230.00	$ 305.00	$ 510.00
Nuclear Power Incentive	$15,000 accession bonus, $2,000 additional upon completion of nuclear power training		

** Varies based on rank and location assigned. Figures here represent amounts for junior officers living in Annapolis, MD.*

***Amounts shown are approximate and will increase with each year in service.*

I applied to the Naval Academy because I saw opportunities in its curriculum and mission that I didn't find anywhere else. I knew that I wanted to work with people and spend as little time behind a desk as I could manage.
—Ensign Genevieve Studer, Class of 2008

After Your First Tour of Duty

By the time you complete your first tour of duty, you will probably have a pretty good idea about your career goals, and the Navy and Marine Corps will give you every opportunity to achieve them. You will have assignments to prepare you for advancement and command of a surface ship, submarine, aircraft squadron, Marine Corps unit or an organization ashore.

Naval officers alternate between tours of duty with shore-based units and operational commands that deploy overseas in support of our nation's maritime strategy. You also have the opportunity for postgraduate study, advanced technical training in your specialty and coursework at military service colleges in leadership, management, tactics, strategy, politico-military affairs and international relations. You never stop learning, even as your responsibilities for people, operations and policy-making increase.

Organization

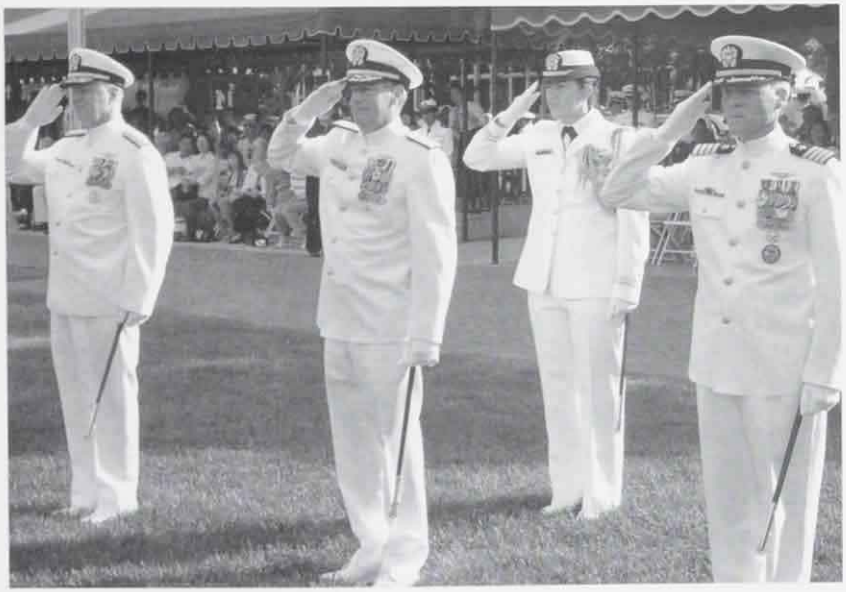
The Superintendent of the Naval Academy, a Navy Vice Admiral, is responsible for the direction and administration of the Academy. The superintendent has several principal assistants who are responsible to him for various programs and operations at the Academy. These assistants include:

The Commandant of Midshipmen functions as the dean of students and is responsible for the moral, character and professional development of the Brigade of Midshipmen.

The Academic Dean and Provost is the principal advisor to the Superintendent in all matters relating to the mental development of midshipmen, academic program and faculty. He manages the academic program in three academic divisions: engineering and weapons, humanities and social sciences, and mathematics and science. The Naval Academy faculty is an integrated group of more than 600 military officers and civilians.

The Director of Athletics heads the Naval Academy Athletic Association, and is responsible for the physical development of midshipmen.

The Dean of Admissions is the principal assistant to the Superintendent in all matters relating to the recruiting, guidance, and selection of candidates for admission to the Naval Academy and the Naval Academy Preparatory School, and for the preparation and maintenance of the official candidate records.



Nobody can actually duplicate the strain that a commander is under in making a decision in combat.
—Admiral Arleigh Burke, USN, Class of 1923

The Chief Financial Officer is the principal advisor to the Superintendent in matters relating to financial resources, human resources and the operation of a network of campus support activities, including the campus bookstore, visitors' center, food service outlets and restaurants, recreation facilities and personal service activities.

The Deputy for Information Technology and CIO is the principal advisor to the Superintendent in all matters relating to information technology, enterprise infrastructure and knowledge management.

The Director, Stockdale Center for Ethical Leadership is the principal advisor to the Superintendent for the ethical development of current and future military leaders.

The Command Master Chief is the principal advisor to the Superintendent in all matters serving Midshipmen, Sailors, Marines and their families.

The U.S. Naval Academy has produced:

1 President of the United States;

2 Cabinet members;

6 Ambassadors;

21 members of Congress;

5 state governors;

5 Secretaries of the Navy;

1 Secretary of the Air Force;

5 Chairmen of the Joint Chiefs of Staff;

4 Vice Chairmen of the Joint Chiefs of Staff;

27 Chiefs of Naval Operations;

9 Commandants of the Marine Corps;

2 Nobel Prize winners;

73 Medal of Honor winners;

52 NASA astronauts *(more than any other institution);*

45 Rhodes Scholars;

19 Marshall Scholars;

93 Olmsted Scholars;

30 Fitzgerald Scholars;

6 Gates Scholars, and

890 Burke scholars

The Board of Visitors

The duty of the Academy's Board of Visitors is to inquire into the state of morale and discipline, the curriculum, instruction, physical equipment, fiscal affairs, academic methods, and other matters relating to the Academy which the board decides to consider (Ex. Section 6968, Title 10, U.S. Code). The Board consists of six members appointed by the President, three appointed by the Vice President, four appointed by the Speaker of the House of Representatives, one designated by the Chairman of the Senate Armed Services Committee, and one designated by the Chairman of the House Armed Services Committee. The President of the United States receives an annual written report of the Board's findings and recommendations.

The 2008 Board of Visitors

Appointed by the President of the United States

Mr. Craig J. Duchossois, *Chair*

The Honorable Nancy Johnson

Mr. Rick Michaels

Mr. Michael Hightower

Mr. Mark C. Treanor

The Honorable Anthony Principi

Appointed by the Vice President

The Honorable Barbara A. Mikulski
U.S. Senator, Maryland

The Honorable Thad Cochran
U.S. Senator, Mississippi

The Honorable Ben L. Cardin
U.S. Senator, Maryland

Appointed by the Speaker of the House

The Honorable C.A. Dutch Ruppersberger
Representative, Second District of Maryland

The Honorable Elijah Cummings
Representative, Seventh District of Maryland

The Honorable John P. Kline
Representative, Second District, Minnesota

The Honorable Rodney P. Frelinghuysen
Representative, Eleventh District, New Jersey

Appointed by the Chairman of the Senate Armed Services Committee/House Armed Services Committee

The Honorable John S. McCain
U.S. Senator, Arizona

The Honorable Mike McIntyre
Representative, Seventh District of North Carolina

Supporting Organizations

Several private, non-profit organizations support the Naval Academy in important ways.

U.S. Naval Academy Alumni Association & Foundation

The United States Naval Academy Alumni Association and the United States Naval Academy Foundation are two independent, not-for-profit corporations sharing a single president and CEO and operating as a fully integrated organization in support of the Naval Academy and its mission. The organization's focus and core competencies are friend raising and fundraising in pursuit of complementary and closely aligned missions.

The course set by Alumni Association founders in 1886 rings true today as the Alumni Association serves and supports the United States, the naval service, the Naval Academy and its alumni: by furthering the highest standards at the Naval Academy; by seeking out, informing, encouraging and assisting outstanding, qualified young men and women to pursue careers as officers through the Naval Academy; and by initiating and sponsoring activities which perpetuate the history, traditions, memories and growth of the Naval Academy and bind alumni together in support of the highest ideals of command, citizenship and government.

With a primary focus on friend raising, the Alumni Association promotes informed advocacy for today's Naval Academy and Brigade of Midshipmen among its many constituents—alumni, parents and friends. The Association keeps its more than 52,000 members informed through a network of 100 chapters around the world, 75 active class organizations and 84 parent clubs. The Association web site, www.usna.com; Shipmate magazine with 10 issues a year and posted online; and other electronic and print publication are the primary communications tools, while value-added benefits and services build affinity to the Naval Academy.

The original Naval Academy Foundation, formed in 1944, set out to support athletic programs at the Naval Academy through scholarships, grants and awards. In 1999, the Foundation and the Naval Academy Endowment Trust merged to form the sole fundraising entity for the Naval Academy, now known as the United States Naval Academy Foundation.

The complementary mission of the Naval Academy Foundation is to support, promote and advance the mission of the Naval Academy by working in conjunction with Academy leadership to identify strategic and institutional priorities and by raising, managing and disbursing private gift funds that provide a margin of excellence in support of the nation's premier leadership institution. The Athletic and Scholarship Programs division is a significant element of the Foundation. This division promotes athletic excellence at the Naval Academy through a comprehensive preparatory school scholarship program and through privately funded grants to athletic and physical development programs for which government funds are not appropriate or not available.

In today's highly competitive world, funding through private gifts is essential to the strategic advancement of a dynamic learning environment that encourages midshipmen to anticipate, prepare for and ultimately lead and serve. The transformational aspects of private giving is seen throughout the Yard in new or renovated buildings, privately-funded faculty positions, or programs which enhance the education of the Brigade of Midshipmen. The Foundation continues to build upon the momentum and achievements in a post-campaign period and work to sustain a culture of philanthropy.

With more than 120 years of history and progress, the U.S. Naval Academy Alumni Association & Foundation are proud to celebrate traditions while partnering with the Naval Academy to sustain a margin of excellence needed to secure a bright future. The organizations are committed to moral, mental, physical and fiscal support of the Naval Academy's mission.

For additional information on the Naval Academy Alumni Association & Foundation, visit *www.usna.com.*

Naval Academy Athletic Association

The Naval Academy Athletic Association (NAAA) promotes and finances the Academy's intercollegiate athletic program, which is one of the largest athletic programs in the country. The NAAA is responsible for the coaching, equipping, travel and lodging, promotion, ticketing and administrative support of all 32 varsity sports. NAAA also operates and maintains Navy-Marine Corps Memorial Stadium, the Naval Academy golf course and other athletic facilities for the Academy.

The NAAA works actively with outstanding high school student-athletes who are interested in applying to the Naval Academy. Varsity coaches recruit young men and women according to the rules and regulations of the National Collegiate Athletic Association (NCAA).

Fans wishing to join the Blue & Gold club, which helps support the varsity athletic program, may do so by calling the athletic department at 410-293-4517. NAAA's main offices are in Ricketts Hall, next to the Armel-Leftwich Visitor Center.

Naval Academy Sailing Foundation

The Naval Academy Sailing Foundation was organized in 1973 to support the Academy's sailing program. Through the foundation, yachts can be donated for use in midshipmen sail training and competition. Such donations also created an endowment that helps support the sailing program. The executive director of the foundation has an office in the Naval Support Activity Annapolis.

The value of tradition to the social body is immense. The veneration for practices or for authority, consecrated by long acceptance, has a reserve of strength which cannot be obtained by any naval device.
—Alfred Thayer Mahan
Class of 1859

Naval Academy Museum

Located in Preble Hall, the Naval Academy Museum contains historic objects and works of art relating to some of the most important episodes in our nation's history. Its collection of more than 50,000 items includes ship models, paintings, prints, uniforms, medals, weapons, manuscripts and other evidence of famous naval officers, ships and nationally significant events. The exhibits in Preble Hall are open to the public seven days a week. The Museum maintains records on all the historic monuments in the Yard and the artifacts shown in the crypt of John Paul Jones, Memorial Hall and other Academy buildings. "One Hundred Years and Forward" is a major new exhibit on the Navy in the 20th century. Another gallery in the Museum features the outstanding Henry H. Rogers Collection of wooden ship models dating from the 17th century and numerous bone ship models. The Beverley R. Robinson Collection of Naval Prints provides more than 6,000 images of ships and sea battles. The Museum contains weapons carried by Captains Stephen Decatur and Oliver Hazard Perry, Admiral David Farragut's plan for the Battle of Mobile Bay, Admiral George Dewey's uniform, the official class ring collection, the table used on the battleship *Missouri* to sign the surrender documents ending World War II in the Pacific, and flags carried to the moon by Academy alumni. The Museum collection is a rich resource for study and research by midshipmen, faculty and visiting scholars.

U.S. Naval Institute

Founded in 1873, the U.S. Naval Institute has served for more than 130 years as the professional member society for the naval services, providing a forum in which Navy, Marine Corps, and Coast Guard professionals are free to discuss issues and concerns and their roles in maintaining America's strength. The Naval Institute is headquartered on the grounds of the Naval Academy and, although independent of the Academy, it serves as the Academy's university press, publishing texts in professional subjects, training guides and manuals, library works, scientific and technical studies in naval history.

Nearly 70,000 members receive the monthly *Proceedings* magazine, and can purchase Naval Institute Press books at reduced prices. In addition, Naval Institute members receive discounts on *Naval History* magazine, professional seminars, and other benefits.

Vice Admiral James B. Stockdale Center for Ethical Leadership

Authorized by the Secretary of the Navy in 1998, the Center for the Study of Professional Military Ethics (CSPME) undertook an ambitious mission – to promote and enhance the ethical development of current and future military leaders. In February 2006, the Superintendent of the Naval Academy directed the expansion of the Center. The expansion builds upon the success of CSPME and aims to better integrate thought about leadership and ethics, specifically as it applies to the Brigade of Midshipmen. The Center is now known as the Vice Admiral James B. Stockdale Center for Ethical Leadership, in honor of this Distinguished Graduate of the U.S. Naval Academy. The mission of the Center is:

To promote and enhance the Naval Academy's development of ethical leaders for service in the Navy and Marine Corps and to advance the practice of ethical leadership in the naval service and nation.

The vision of the Center is to be:

The center of excellence for leadership, ethics, and character development for the U.S. Naval Academy and the naval service. The center will enrich programs that inspire Naval Academy, fleet, and national leaders to accomplish their missions with integrity, excellence, selflessness, and compassion.

The Center sponsors conferences and lecture series, provides speakers for Naval Academy and national events, administers a fellowship program that provides an opportunity for military professionals and accomplished academics to share ideas and conduct research about important ethical leadership issues, supports the professional development of faculty teaching leadership and ethics, and develops new concepts and resources for the Naval Academy, Navy, Marine Corps, and select national institutions.

Appendix A: Medical Considerations for Admissions

The Naval Academy program is physically challenging. All candidates are required to undergo a thorough medical examination because Academy graduates are commissioned in a wide variety of exciting career fields with strict medical standards. The medical process begins after you have completed five documents of your application. At that time, the U.S. Naval Academy Admissions office will upload your name to the Department of Defense Medical Examination Review Board (DoDMERB).

DoDMERB will schedule your medical examination and carefully review the reports to determine if you meet our medical standards for admission. DoDMERB will consider your medical history and information on illnesses, injuries, surgery, familial diseases, and other factors that could affect your medical status. You might be asked to submit additional reports and/or records from physicians or hospitals.

Approximately a month after your physical is completed you will receive (by mail) a status report of the DoDMERB findings. If your admissions record is competitive, and if the disqualifying condition is one for which a waiver might be possible, we will ask DoDMERB to prepare your file for waiver consideration. You may have to provide amplifying information on the condition or undergo evaluation by a medical specialist. A waiver of the medical standard may be granted if your medical condition will not prevent you from successfully completing your four years at the Naval Academy and fulfilling your five year service commitment.

Major medical considerations are summarized here so that you and your doctors can anticipate if you meet the basic requirements for admission to the Academy. This is not meant to be a comprehensive listing of all disqualifying conditions; it is a brief and general summary for your convenience.

Eyes and Vision Disqualifications

Below is a listing of those eye and vision disqualifications that are the most prevalent. This listing, while comprehensive, does not contain all possible disqualifications for eyes and vision.

1) Vision not correctable to 20/20 in both eyes is disqualifying. Refractive error exceeding + or –6.00 diopters and astigmatism exceeding 3.00 diopters is disqualifying.

2) Substandard color vision is disqualifying. Requests for waiver of the color vision standard are normally not considered. Color vision is also retested on Induction Day.

3) Many chronic eye diseases/conditions such as keratoconus, glaucoma, optic atrophy, uveitis and retinal degenerations are disqualifying. A waiver is normally not considered.

4) Procedures to change the refraction (refractive surgery) including but not limited to: Lamellar and/or penetrating keratoplasty, radial keratotomy and astigmatic keratotomy are disqualifying. Refractive surgery performed with an Excimer Laser, including but not limited to, Photorefractive Keratectomy (PRK), Laser Epithelial Keratomileusis (LASEK), and Laser-Assisted in situ Keratomileusis (LASIK) is disqualifying if any of the follow conditions apply: the pre-operative refractive error exceeded +6.00 or –6.00 diopters (spherical component only) in either eye, pre-operative astigmatism exceeded 3.00 diopters, at least six-month recovery period has not occurred between last refractive surgery or augmenting procedure and accession medical exam, there have been complications and/or medications or ophthalmic solutions required and post-surgical refraction in each eye is not stable.

5) If you wear glasses or contact lenses, take them with you to your DoDMERB eye examination. If you wear soft contact lenses, do not use them during the three days preceding your examination. Do

not use hard or gas permeable lenses for 21 days before your examination. If you are undergoing orthokeratology or other forms of corneal refractive treatment, do not use your rigid lenses for 90 days.

Height and Weight Standards

The minimum qualifying height is 62 inches for men and 60 inches for women, and the maximum qualifying height for all candidates is 78 inches. Waivers may be granted to a limited number of exceptional candidates whose height exceeds this standard.

The minimum qualifying weight (by height) standards are listed in the table. Because of substantial variation in candidates' body composition, we apply an estimated body fat percentage when a candidate's weight exceeds the maximum listed. We will ask you to provide several measurements (if you don't fall within standards) with clear instructions so you may ask your gym teacher, (perhaps when you take your Candidate Fitness Assessment), a coach, or your school nurse to provide the information.

In such cases, the qualifying standard is the body fat percentage: no more than 25 percent for men and 35 percent for women, as determined by our protocol. If your weight is at least the minimum and not more than the maximum shown for your height on the preceding table, you will not be asked to provide measurements for the body fat estimate.

Obesity will not be waived. If you exceed the body fat percentage standard on Induction Day, you may be denied admission to enter the Academy.

HEIGHT AND WEIGHT STANDARDS

Height (inches)	Men		Women	
	MIN	MAX*	MIN	MAX*
60	—	—	92	142
61	—	—	95	145
62	103	152	97	149
63	104	157	100	152
64	105	162	103	156
65	106	167	106	160
66	109	172	108	163
67	111	177	111	167
68	115	182	114	170
69	119	188	117	174
70	123	192	119	177
71	127	196	122	181
72	131	201	125	185
73	135	206	128	188
74	139	211	130	192
75	143	216	133	195
76	147	221	136	199
77	151	226	139	203
78	153	231	141	206

* *If your weight exceeds that shown for your height, you will be asked to provide measurements from which the Office of Admissions will estimate body fat percentage.*

Heart and Vascular System

Among the disqualifying conditions are: uncorrected septal defect; congenital, rheumatic, or other abnormality of the heart valves or major vessels; abnormal heart rate or rhythm; blood pressure predominantly in the range of 140/90 or greater; severe or symptomatic varicose veins; and mitral valve prolapse which has either caused symptoms or been associated with rhythm disturbance or regurgitation.

Ears and Hearing

Both ears must be free of tympanic membrane perforation and acute and chronic disease. The average of the hearing loss at 500, 1000 and 2000 Hz in either ear may not exceed 30 decibels (ISO), and the loss at any one of these three frequencies may not exceed 35 decibels. The maximum acceptable loss in either ear at 3000 Hz is 45 decibels and, at 4000 Hz, 55 decibels.

Respiratory System

A history of asthma, recurrent asthmatic bronchitis, exercise-induced bronchospasm, or reactive airway disease by any other name is disqualifying. Symptomatic nasal polyps, severe hay fever, and tuberculosis (if active within two years) will also result in disqualification. Nasal septal deviation, hypertrophic rhinitis, and other conditions that cause significant reduction of flow through either airway or which interfere with drainage of a sinus are disqualifying. Allergy immunotherapy is disqualifying if received within the 12 months preceding the examination.

Musculoskeletal System

Un-united fractures, history of surgery to a major joint within six months, history of derangement of any major joint not corrected by surgery or evidence of instability subsequent to surgery, history of anterior or posterior cruciate ligament injury, retained orthopaedic devices, arthritis, severe scoliosis, symptomatic structural abnormalities of the spinal column, and herniated nucleus pulposis or history of spinal surgery for this or any other condition are disqualifying.

Genitourinary System

Persistence of protein (except documented benign orthostatic proteinuria), sugar, or red or white blood cells in the urine is disqualifying, as are a history of recurrent or bilateral kidney stones. Severe congenital or developmental anomalies, hormonal disorders, neoplastic conditions, persistent or recurrent infections, and certain complications of infections are cause for rejection. An undescended testicle is disqualifying, as are pregnancy, endometriosis, and severe dysmenorrhea.

Gastrointestinal System

History of peptic ulcer, gastroesophageal reflux disease (GERD), gallbladder disease, regional enteritis (Crohn's Disease), ulcerative colitis, or any other inflammatory bowel disease is disqualifying.

Neuropsychiatric Disorders

Seizure disorders (but not uncomplicated febrile convulsions in childhood), degenerative conditions, traumatic brain injuries, recurrent or severe headaches, and severe motion sickness susceptibility are disqualifying. History of psychosis or affective illness, personality disorder or immaturity, stammering, stuttering, eating disorders such as bulimia and anorexia, and bedwetting or sleepwalking persisting into adolescence also are disqualifying. Academic skills defects, such as learning disabilities or Attention Deficit Hyperactivity Disorder are not disqualifying if academic success can be demonstrated without the use of classroom accommodations, and no medication has been used in the past 12 months.

Skin

Chronic diseases such as psoriasis, atopic dermatitis, and eczema are cause for rejection. Severe acne is disqualifying until successfully treated. If a course of Accutane is undertaken, this should be completed, with documentation of a favorable outcome, prior to Induction Day. Pilonidal cyst, if evidenced by a discharging mass, is cause for rejection until repaired successfully.

Tattoos and Body Alterations

The Naval Academy strongly supports the U.S. Navy Policy prohibiting body alterations that are prejudicial to good order, discipline and morale or are of a nature to bring discredit upon the Naval Service. Body alterations that are excessive, obscene, sexually explicit or advocate or symbolize sex, gender, racial, religious, ethnic or national origin discrimination, as well as any body alteration that advocates or symbolizes gang affiliation, supremacist and extremist groups, or drug use are prohibited. Any body alteration that is visible in uniform clothing is prohibited. Midshipmen are prohibited from acquiring body alterations while a member of the Brigade of Midshipmen or while a member of the Naval Academy Preparatory School. Pre-existing body alterations must also adhere to the above stated Navy policy. Nothing in USNA policy prohibits a single non-elongated perforation of each earlobe on female applicants, candidates, NAPS students or midshipmen. The use of gold, platinum, or other veneers or caps for the purposes of dental ornamentation are prohibited.

Candidates accepting an offer of appointment will be asked to state whether any of the above conditions are present. All candidates so identified will undergo independent review by the Body Alteration Review Board. Candidates with any skin marking which does not conform to our policy may be denied admission unless the condition can be corrected before induction or the candidate agrees to pursue correction after reporting (at their own expense).

Other Disqualifying Conditions

Some other disqualifying conditions include:

- unrepaired abdominal wall hernia
- removal of the spleen for most reasons except trauma
- anemia
- abnormal bleeding states
- diabetes mellitus
- thyroid disorders
- sickle cell disease (sickle cell trait and glucose-6-phosphate dehydrogenase deficiency are not disqualifying)
- any active communicable infection
- Hepatitis B carrier state
- generalized reaction to stinging insect venom
- family history of malignant hyperthermia
- allergy to common foods requiring special dietary considerations
- a history of drug abuse, alcohol abuse, or alcohol dependence
- exposure to the virus associated with AIDS (Acquired Immune Deficiency Syndrome).

A blood test for the presence of AIDS virus (HIV) antibodies, an alcohol breath test, and a urine test for drugs and pregnancy are performed on Induction Day at the Naval Academy; a confirmed positive result in any of these will lead to disqualification without possibility of a waiver.

Dental Standards

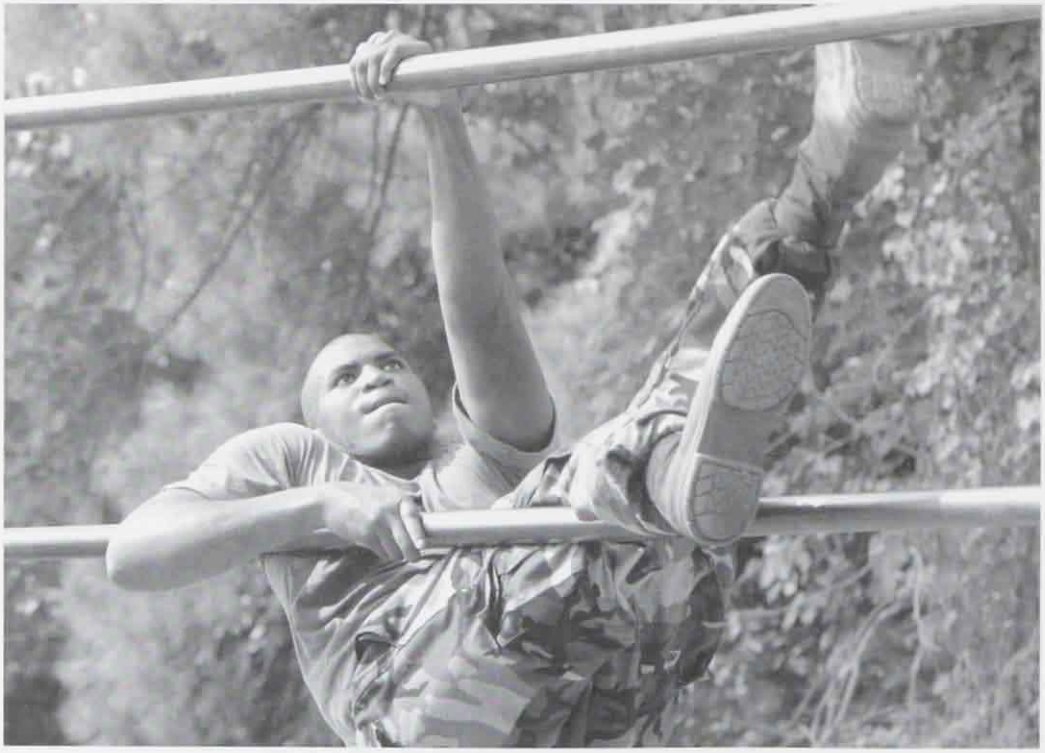
Except for minor or questionable areas, you should have all required dental treatment completed before your medical examination. Missing teeth causing reduced chewing or biting efficiency must be replaced by well-designed bridges, partial dentures, or implants in good condition. If you are undergoing active orthodontic treatment that will not be completed prior to your entry into the Naval Academy, you will automatically be considered for a waiver. The Naval Academy Dental Clinic provides comprehensive dental care for the Brigade of Midshipmen. Current orthodontic appliances for continued treatment are disqualifying. Retainer appliances are permissible, provided that active orthodontic treatment has been satisfactorily completed. In the extreme case where long term treatment (more than 18 months) has been ongoing and cannot not be appropriately completed prior to I-Day please notify Admissions Medical immediately for consideration of a waiver. This will be considered on a case-by-case basis with discussion between your orthodontist and USNA Dental. Other disqualifying dental conditions include:

- infections or chronic diseases of the soft tissue of the oral cavity;
- marked malocclusion that requires early or prolonged treatment, involves tissue impingement on either the facial or lingual/palatal gingiva, or in some other way jeopardizes dental health;
- unsatisfactory restorations, bridges, dentures, or implants;
- severe or extensive apical or periodontal infection;
- perforations from the oral cavity into the nasal cavity or maxillary sinus; and
- tumors or cysts of the oral tissues that can be expected to require treatment in the foreseeable future.

Concluding Comments

As you will realize from the foregoing summary, the physical examination for admission to the Naval Academy is comprehensive, and the medical/dental standards are specific and strict. This is necessary because our goal is for every midshipman to be able to anticipate unrestricted opportunities for commissioned service after graduation. For most candidates, the physical examination process will require no more than a single visit to the office of a physician and an optometrist. For others, questions will arise that may necessitate a variety of additional evaluations.

We know this can become time-consuming, but we hope you will understand the reason for our concern. Questionable issues resolve favorably for the majority of candidates, and waiver of the standard(s) is often possible when documentation of a disqualifying condition in an individual candidate supports the expectation of unrestricted service. Staff members at DoDMERB and in the Admissions Office will assist in every way possible.



Appendix B: Administration, Faculty and Staff

Office of the Superintendent

Superintendent
Jeffrey L. Fowler, Vice Admiral, USN
M.P.A., Harvard University
M.B.A., Chaminade University of Honolulu

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M.A., Naval Postgraduate School
Command Master Chief
Evelyn Vonn Banks, CMDCM (AW/SW), USN
B.A., University of Phoenix
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M.S. Naval Postgraduate School
Flag Secretary
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M.S., Naval Postgraduate School
Flag Lieutenant
Anne Gibbon, Lieutenant, USN
B.S., U.S. Naval Academy
Diversity Advisor to the Superintendent
Tony Barnes, Captain, USN
M.A., Naval War College
Special Assistant to the Superintendent
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B.S., U.S. Naval Academy
Flag Supply Officer
James Zakar, Lieutenant, SC, USN
B.S., U.S. Naval Academy
Protocol Officer
Janet Z. Price
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F. Joseph Rubino, P.E., Esq.
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M.S., Naval Postgraduate School
Director of Special Events
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M.A., Naval War College
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D.D.S., Ohio State University
Administrative Officer
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Executive Director Academy Projects
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B.F.A., B.A., Rhode Island School of Design

Comptroller
Todd A. Hauge, Commander, USN
M.S., Naval Postgraduate School, P.E.

Deputy Comptroller
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Director, Human Resource Management
Lisa Jox
M.A., University of Maryland
Director, Non-Appropriated Fund Program
Syd Rodenbarger, Captain, USN (Ret.)
M.A., Naval Postgraduate School

Deputy for Information Technology Services
Louis J. Giannotti, Commander, USN (Ret.)
M.S., Naval Postgraduate School

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Deputy Director, Finance and Operations Department
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M.S., Naval Postgraduate School
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Assistant Director, Local Networks
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Office of the Dean of Admissions

Dean of Admissions
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B.S., U.S. Naval Academy

Director of Admissions
Pat L. Williams, Commander, USN
Ph.D., Capella University
Director, Nominations and Appointments
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B.A., Mount Holyoke College
Budget /Financial Manager & HR
Tracy Sims, LCDR (Ret.), USN
M.S., Naval Postgraduate School

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B.S., U. S. Naval Academy
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Samoa McClanahan, Lieutenant, USN
B.S., Southern University
Kristina Melendez, Lieutenant, USN
B.S., U. S. Naval Academy
Jeanine Benjamin, Lieutenant, USN
B.S., U. S. Naval Academy

Office of the Commandant of Midshipmen

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M.S., University of Tennessee

Deputy Commandant
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B.S., U.S. Naval Academy
Administrative Officer
Wesley Skibo, Lieutenant, USN
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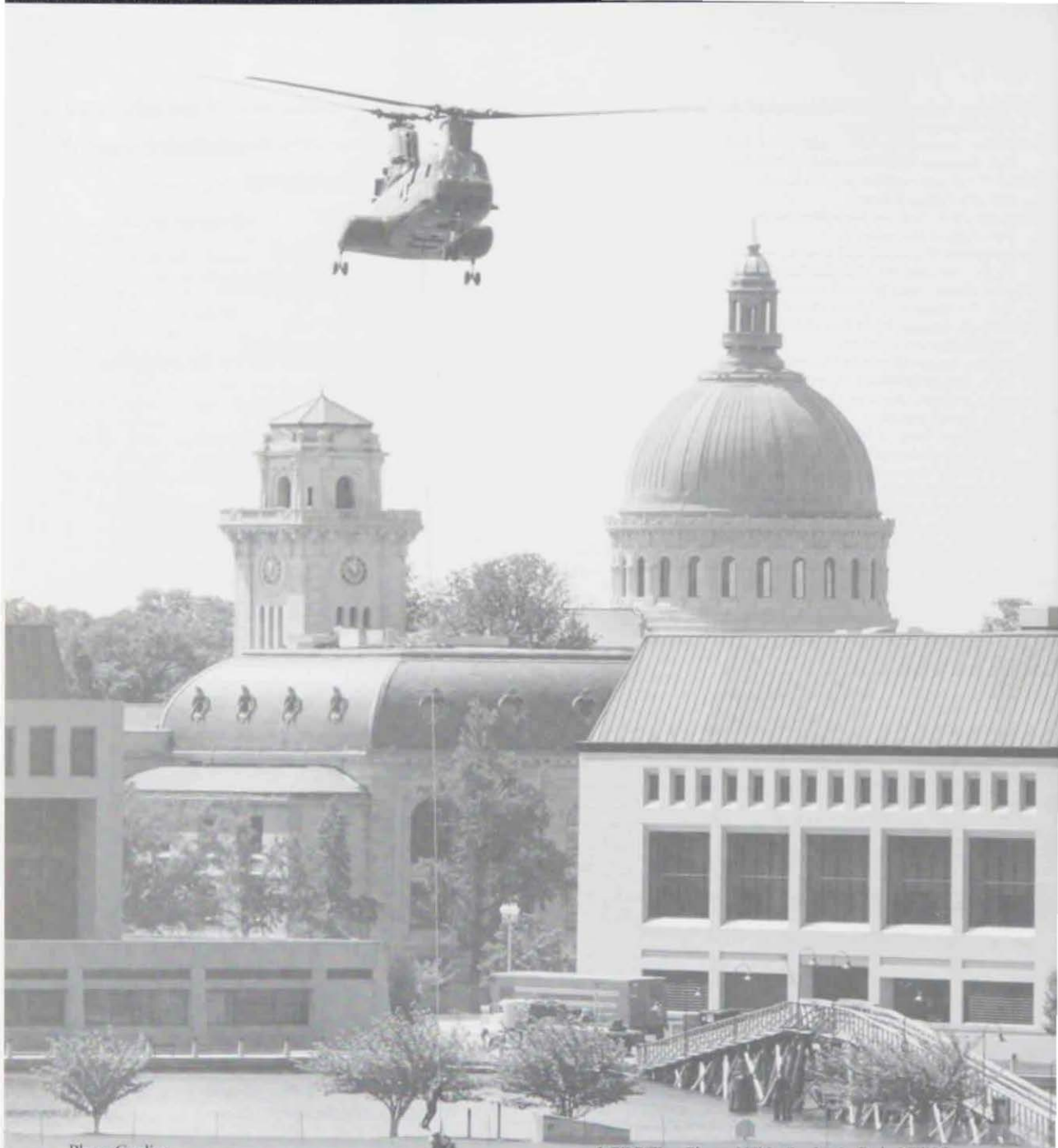

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DONT GIVE UP
THE SHIP

Calendar for Candidates
Class of 2013

Refer to the steps in the Admissions Chapter.

April 1, 2008 Earliest date applications accepted.
January 31, 2009 Last date applications accepted.

2008

Spring Junior year. Write your U.S. representative and both U.S. senators to request a nomination. Although many members of Congress will accept later requests, some into the early months of your senior year, others select their nominees much earlier. Write the vice president for a nomination (very competitive) if you believe you are highly qualified for admission. Complete a Preliminary Application at www.usna.edu/Admissions/pre-application.

June After submitting an online Application prospective candidates will be scheduled for medical examinations at designated medical examining centers. Each candidate is individually notified by the Department of Defense Medical Examination Review Board (DODMERB) in Colorado.

July 1 - Jan. 31 If eligible (as explained in Admissions Section), write the Superintendent, United States Naval Academy (Attn: Nominations and Appointments Office) requesting presidential and/or other military service-connected nominations.

August Official candidates may expect to be contacted by a local representative of the Naval Academy Information (Blue and Gold Officer) Program.

Mid-October Early offers of appointment are made to outstanding candidates. Offers continue into the following spring as admissions files on candidates are completed and additional well-qualified candidates are identified.

November 1 Deadline for receipt by the Vice President of requests for nominations.

2009

*January SAT-I test. Last SAT-I test of the month utilized to evaluate class of 2013 admission.

March 1 Candidate files must be completed.

April 15 With few exceptions, all candidates will be notified on or before this date whether or not they have been accepted for entry.

July 1 Class of 2013 reports to the Naval Academy and takes oath of office as midshipmen.

* SAT/ACT tests should be taken as early as possible. See your guidance counselor for exact date and for additional information on testing forms and registration deadlines or
visit the test centers' official websites: www.collegeboard.com or www.act.org

Note: Please request the applicable testing service(s) to forward the results of your examinations to the Naval Academy (SAT Code 5809, ACT Code 1742).

Tentative Calendar 2008-2009

2008

July 2	Class of 2012 enters.
August 20	First semester begins.
September 1	Labor Day, holiday.
November 11	Veterans' Day observed, holiday.
November 27-28	Thanksgiving leave period.
December 10-18	Examinations.
December 18-January 6	Holiday leave begins after last scheduled examination or military duty, whichever is later.

2009

January 7	Classes begin.
January 19	Martin Luther King Jr. Birthday, holiday.
February 16	Presidents' Day, holiday.
February 9-13	First marking period.
March 14	Mid-term leave begins after last scheduled. class or military duty, whichever is later.
March 22	Mid-term leave ends.
March 24-28	Second marking period.
April 28	Classes end.
April 29- May 7	Final examinations.
May 17-22	Commissioning Week begins.
May 22	Graduation.
May 25	Memorial Day, holiday.

For more up-to-date calendar information, please consult the U.S. Naval Academy web site: *www.usna.edu.*

This catalog should not be considered a contract between the United States Naval Academy and any prospective candidate. The curriculum, policies and dates are subject to change to meet varying requirements of the Navy.

Traveling to Annapolis

From the West:
Pick up I-70 and head east towards Baltimore. Exit onto MD 29 south. Proceed 2.5 miles, take Rt. 100 east. Pick up I-97 south and follow to intersection of MD Rt. 50 east.
From the South: I-95 north through Richmond, VA, to Rt. 207 north. Go 11 miles to Rt. 301 and follow it all the way north into Maryland to where it intersects MD Rt. 50.

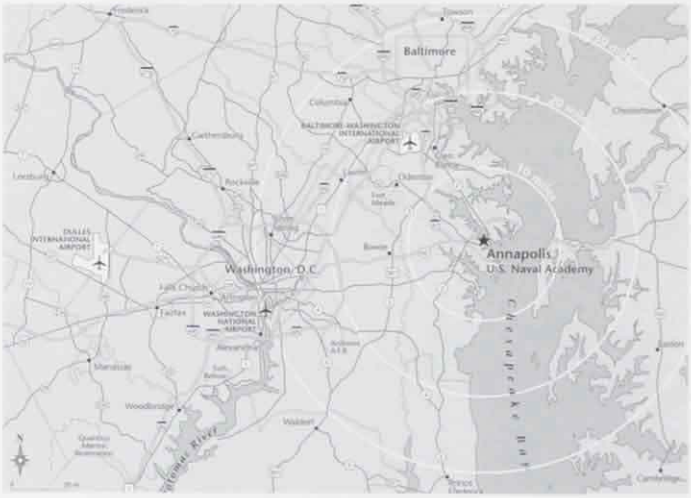
From the Northeast:
New Jersey Turnpike south to Delaware Memorial Bridge. Take DE Rt. 13 south to DE 896 north. Proceed appx. 5 miles to DE Rt. 301 south. This becomes MD Rt. 301. Follow to intersection of MD Rt. 50 west, and cross Chesapeake Bay Bridge. Continue on Rt. 50 west to exit for Rt. 450, marked "Naval Academy." Follow Rt. 450 south, cross Severn River Bridge, and proceed past Gate 8 to the next traffic light. Make a left turn onto King George Street, which will take you to Gate 1. These directions save time and substantial mileage by avoiding Baltimore, and are also best for those coming from the Philadelphia area.

From Maryland's Route 50:
Heading eastbound, exit at Rowe Boulevard (Exit 24). Bear right off of ramp. At second traffic light, go left onto Taylor Avenue, follow through one blinking light, then right and left bends to stoplight at King George Street. Turn right and proceed straight to Gate 1.

Air
Baltimore-Washington International Airport (BWI) is convenient to Annapolis and serves most major airlines. A shuttle service runs regularly to the academy from BWI. Washington's National Airport and Virginia's Dulles International Airport are more than an hour's drive from Annapolis. Rental cars, taxicabs and limousine services are available at all three airports.

Rail
Amtrak serves Baltimore, Md., 30 miles away, New Carrollton, 17 miles away, BWI Airport, 22 miles away, and Washington, D.C., 33 miles from Annapolis. Taxi service is available from all rail terminals.

Bus
Greyhound/Trailways have terminals in Washington and Baltimore. Local buses run regularly from Baltimore, and Greyhound/Trailways schedule three buses daily from Washington.



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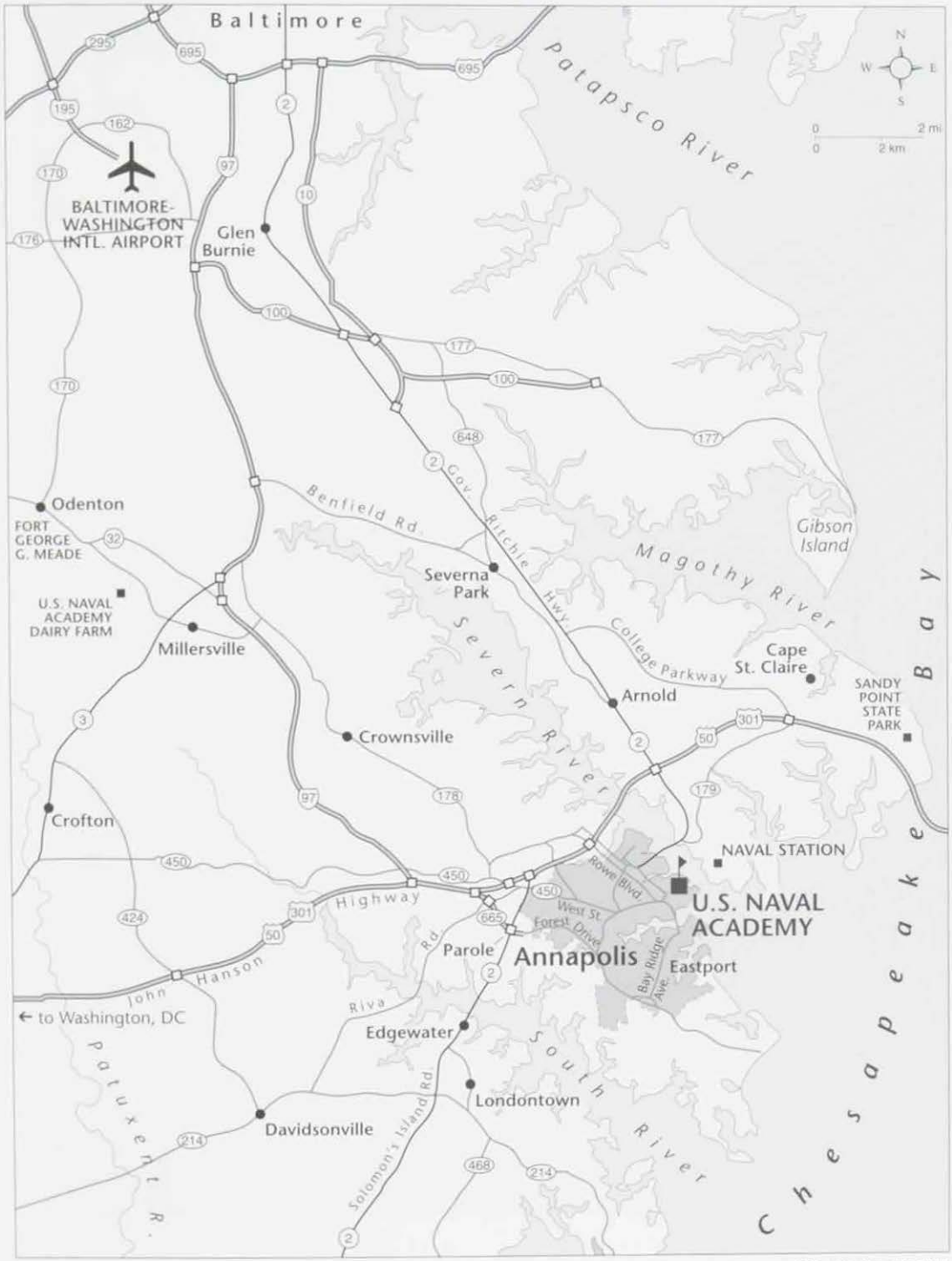

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The Honor Treatise

As a Brigade, we cherish the diverse backgrounds and talents of every midshipman yet recognize the common thread that unites us: the trust and confidence of the American people. They have appointed us to defend our country by developing our minds, our bodies, and most especially, our moral character.

It is our responsibility to develop a selfless sense of duty that demands excellence both of ourselves and of those with whom we serve. We must honor our loyalties without compromising our ultimate obligation to the truth. Our leadership must set a standard that reflects loyalty to our goals and the courage to stand accountable for all our actions, both those that lead to success and to those that end in failure. We will never settle for achieving merely what is expected of us but will strive for a standard of excellence that reflects the dedication and courage of those who have gone before us. When we attain our goal, we will raise our expectations; when we fall short, we will rise up and try again. In essence, we espouse leadership by example, a leadership that will inspire others to follow wherever we may lead.

Countless challenges and trials lie before us. We believe that those with the strongest moral foundation will be the leaders who best reflect the legacy of the Naval Academy. This is our call as midshipmen: it is a mission we proudly accept.

Vice Admiral William P. Lawrence, USN (Ret.), Class of 1951, was the first naval aviator to fly Mach II in a NavyF-8U Crusader. A POW from 1967 to 1973, he resumed his career in the Navy and went on to become the Superintendent of the U.S. Naval Academy in 1978, where he authored the "Honor Treatise" and went on to become the Deputy Chief of Naval Operations before his retirement in 1986. He then became Chairman of the Naval Leadership Department at the Academy, and later served as president of the Association of Naval Aviation.

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