United States Naval Academy

2010-2011
Academic Catalog

Honor . . . Courage . . . Commitment

Profile

The mission Founded as the Naval School in 1845, the United States Naval Academy today is a four-year service academy whose mission is : "To develop midshipmen morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to graduate leaders 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."

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 4,500 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. 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

Dear Future Midshipmen:

At the United States Naval Academy, our mission is to prepare the next generation of leaders for our naval service and the future security of our nation. Since 1845 more than 77,000 young men and women have successfully completed fours years of moral, mental and physical development to take their place as honorable leaders in the Navy and Marine Corps.

These leaders have included: 73 Medal of Honor recipients, one President of the United States, several members of Congress and U.S. ambassadors, 46 Rhodes Scholars, and two Nobel Prize winners.

Their journeys began at the United States Naval Academy in Annapolis. And every summer, the future begins again with new journeys for 1,200 young people from all 50 states.

Our midshipmen complete a demanding four-year program which educates them not only in the classroom, but develops them outside of the classroom as well -- aboard sailboats, Yard Patrol craft, on the athletic fields and in the Fleet. At the academy, midshipmen will cultivate leadership skills which will enable them to excel as honorable leaders when they graduate and begin their careers as Navy and Marine Corps officers.

We emphasize the importance of personal integrity and service in all aspects of our program. The Naval Academy offers a unique opportunity where young men and women from a diversity of backgrounds come together to learn and embark on a lifetime pursuit of excellence. Midshipmen are held to the highest standards of honor, conduct and service while they learn from both military and civilian faculty who represent the best in their respective specialties. Midshipmen become young leaders who are ready to serve our nation as Navy or Marine Corps officers -- and eventually as leaders in government, industry and our communities. Leadership and Honor are what distinguish the U.S. Naval Academy and its graduates.

At the Naval Academy, the American people invest in the future of our nation. This is where we develop the leaders of the future and nurture core values of honor, courage, and commitment. Our institution is a nationally recognized treasure where talented young Americans embark on a lifetime of service. It is my sincere desire that this catalog will be a starting point for prospective applicants, their parents, their mentors and educators in learning about the tremendous opportunities that are the United States Naval Academy.

Sincerely,

Michael H. Miller
Vice Admiral, U. S. Navy
Superintendent

Contents

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 our country's 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 just 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 original 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 22 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 graduate leaders 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 soon be responsible for the priceless lives of young Sailors and Marines 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 midshipmen develop 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 originally formulated in 1951 which states, "Midshipmen are persons of integrity: they stand for that which is right." These Naval Academy "words to live by" are based on 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. The goal is a broad-based education to 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

The duties of Navy and Marine Corps officers often require long, strenuous hours in difficult situations. The Naval Academy therefore teaches the importance of being physically fit and prepared for stressful 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. 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 2014 Snapshot

Applications

Men	13,450
Women	3,967
Total	17,417

Offers of Appointment

Men	1,150
Women	314
Total	1,464

Class Size

Men	982
Women	263
Total	1,245

Nominating Categories

Presidential	773
Congressional	4,658
Secretary of the Navy	377
ROTC/JROTC	312
Children of Deceased or Disabled Veterans	22

Demographics

White	807
Hispanic	176
Asian American/ Pacific Islander	
Native American	133
African American	129

Geographical Distribution & International Students

Midshipmen were admitted from every state in the nation, as well as Washington, DC, Puerto Rico, Guam American Samoa, Northern Marianas and the U.s. Virgin Islands. The Class of 2014 also includes 12 international students from: Brunei (1), Ecuador (2), Georgia (1), Jamaica (1), Lebanon (2),Lithuania (1), Maldives (1), Panama (1), and Taiwan (2).

Alumni Sons and Daughters

The Class of 2014 includes 61 sons and 17 daughters of Naval Academy alumni. Five members of the class have both parents who are alumni of the Naval Academy.

Military Background

Total Former Enlisted*

Navy	27
Marine Corps	7
Total	34

**Includes 12 who entered directly from the Navy (7 of whom came from the Nuclear Power School) and 22 from the Naval Academy Preparatory School (15 USN, 7 USMC).*

Composition

Top 10% of H.S. Class	50%
Top 25% of H.S. Class	76%
Top Third of H.S. Class	82%
Varsity Athletics	90%
Community Service	85%
Dramatics, public speaking, debate	76%
Captain/Co-captain of Sports Team	63%
Student Body Leader	61%
National Honor Society	58%
Church Group	53%
Tutoring	40%
Work Experience (>10 hours/week)	28%
Musical Activities (Band, Chorus, etc.)	28%
ROTC/JROTC/Sea Cadets/Civil Air Patrol	18%
Hardship or adverse life experience	13%
School Publication	12%
First Generation American	9%
Primary Language in home other than English	6%
First to attend college in family	6%

College Board Data

Middle 50th percentile*

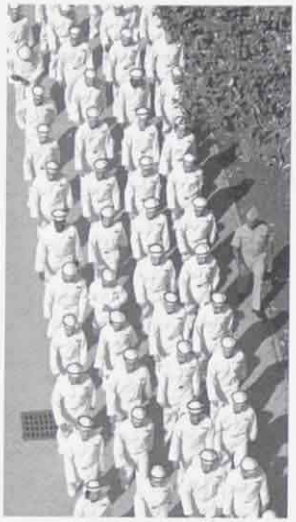
Verbal 570-690 Math 600-710

**50% of the class achieved SAT scores within the range between the 25th and 75th percentile.*

Educational Background

The Class of 2014 includes 390 (31%) from college and post-high school preparatory programs which include:

- 261 from the Naval Academy Preparatory School (NAPS) in Newport, R.I.;
- 7 from Nuclear Power Program
- 59 from the U.S. Naval Academy Foundation Program; (30 from preparatory schools and 29 from colleges
- 63 additional students have completed at least one year of study at a college or university.



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 2010 edition of "America's Best Colleges" by U.S. News & World Report.

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

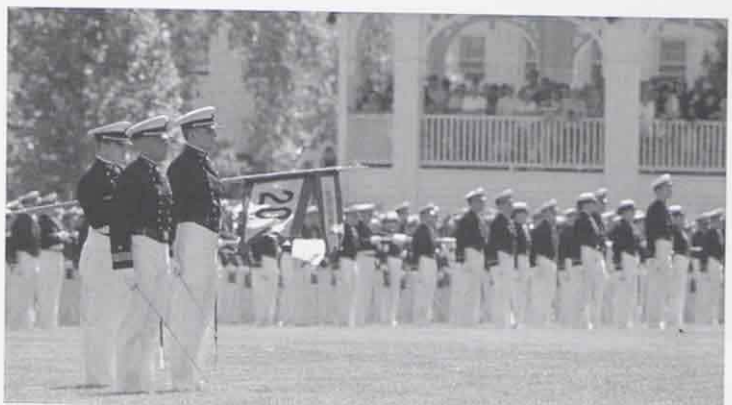
Our Commitment

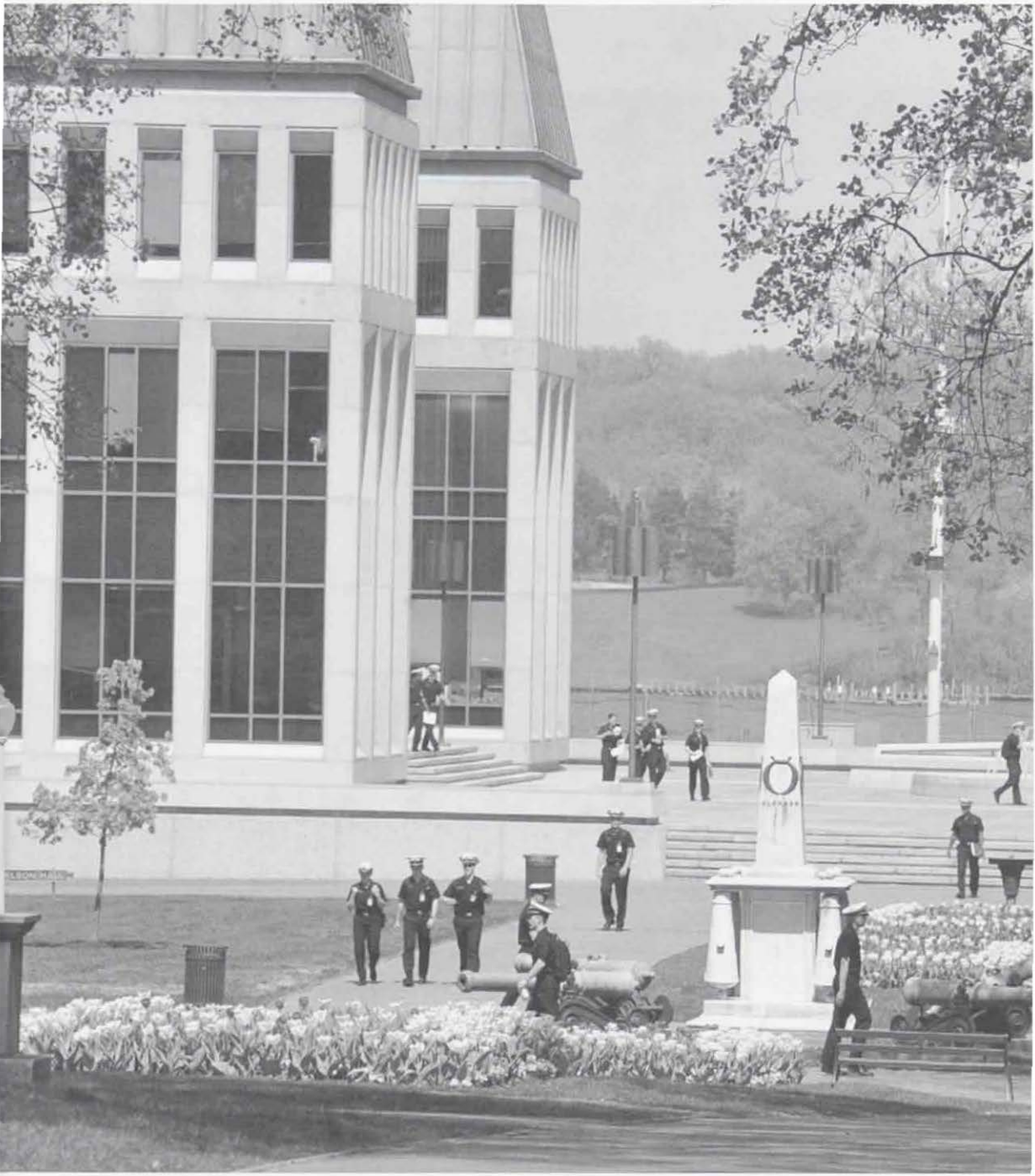
Setting apart the Naval Academy from almost every other college and university in the country is our commitment to the total development of our students. Some other colleges offer more majors in academics. Some put more emphasis on intercollegiate athletics. But nowhere else will you find a better opportunity 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, group and individual counseling is available 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, senior enlisted advisor, and upperclass midshipmen in leadership positions also guide, monitor and evaluate your progress in academics, military performance and conduct. They also are ready to help iif you need assistance 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 well 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.





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 2014 includes 35 percent minority midshipmen who represent the unique racial and ethnic minority backgrounds found throughout our nation. The Class of 2014 is comprised of 21 percent 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.

"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 his/her 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;
- qualify physically by passing 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.

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.

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. To be considered for entry you must apply between April 1st and January 31st of the year prior to entry. For college applicants, it is recommend that you take the following classes during your first semester – Calculus, Chemistry with Laboratory, English Composition, and U.S. History. Military applicants should notify their chain of command prior to starting the application. 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 2015. The college code numbers to forward your test scores to the Naval Academy are: SAT- 5809; ACT - 1742.

Non-standard, un-timed SAT and ACT tests are not acceptable for consideration for admission.

The Admissions Process

Candidate Status - 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).

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

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 the best resource for advice and for obtaining specific information about your 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.

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 or laser procedures to improve vision, are discussed in Appendix A.

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 be 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 their nomination process, 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 the specific 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 charged to 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. Adopted children are eligible.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office.

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 1 March and 31 October of the year prior to admission.

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

All Navy ROTC units and all Navy and Marine Corps JROTC units are eligile to nominate three candidates each. All Army and Air Force Honor units with Distinction are also eligible to nominate three candidates. All units must submit a copy of their orders along with the completed nomination form available online at: www.usna.edu/steps4.htm.

Application deadline: January 31

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

Selection for Appointment

The Naval Academy uses a "rolling admissions", selection process. The Admissions Board begins meeting in September and evaluates applications as they are completed by candidates. An application is considered "completed" when all candidate forms are submitted, all required documents are received, the candidate fitness assessment results are received, and the Blue and Gold officer interview is received by the Office of Admissions. It is in your interest to complete your application as soon as possible.

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

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 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

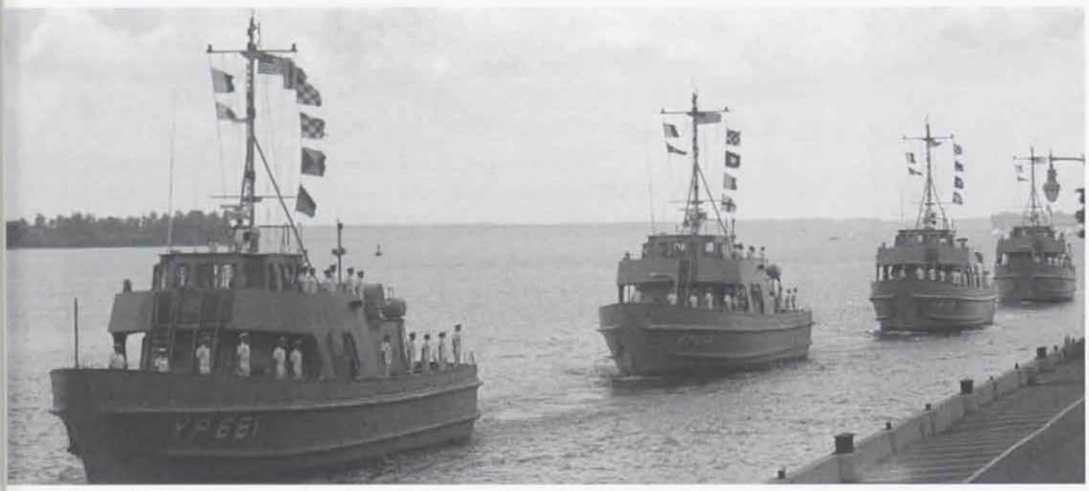
If you enter the Naval Academy or the Naval Academy Preparatory School from the Navy or Marine Corps, the remaining period of your enlistment or obligated service is not terminated when you accept an appointment to the academy. Therefore, if you do not fulfill the Agreement to Serve, you will return 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 highly selective 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 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 residence hall 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 22 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).

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 special warfare and Marine Corps combat arms MOS's.

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. If you are home-schooled, 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.

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.

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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 after you've experienced the exhausting rigors of Plebe Summer, and after you have faced the responsibility of leading other midshipmen and after you have thrown your hat into the air at graduation will you really know what the Naval Academy experience is all about. Make no mistake: the four years at Annapolis are very challenging, tightly structured, and designed to push you well 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.

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.

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 150 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 Robert E. Clark II, the 84th Commandant of Midshipmen, graduated from the United States Naval Academy in 1984. He is a career Submarine Officer whose command tours include Commanding Officer, USS Connecticut (SSN 22) and Commodore, Submarine Squadron FOUR. He holds a bachelor of science degree in engineering from the U.S. Naval Academy and a master's of science degree in National Security Affairs from the Naval Postgraduate School. As Commandant of Midshipmen, he oversees the professional development and day-to-day lives of the Brigade of Midshipmen.

"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, while at the same time carrying on a proud tradition of leadership and honorable service to our great nation.

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 traversing the ocean depths in a nuclear-powered submarine, flying off of an aircraft carrier, steaming across the seven seas on a surface warship, or serving in the field with our Marines, you will experience firsthand 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 4,500-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.

"I wouldn't give up plebe summer for anything in the world. I formed relationships and friendships for the rest of my life."
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.

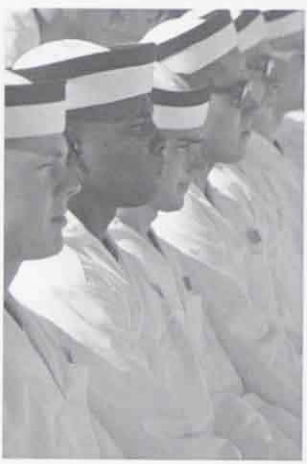
Plebe Summer introduces you to the basic how-to's of the Navy as well. Aboard Naval Academy sailboats, you learn to respect the power of wind and current. You learn the basics of seamanship, navigation and boat handling. On the weapons range, you learn how to fire small arms safely and accurately. You 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

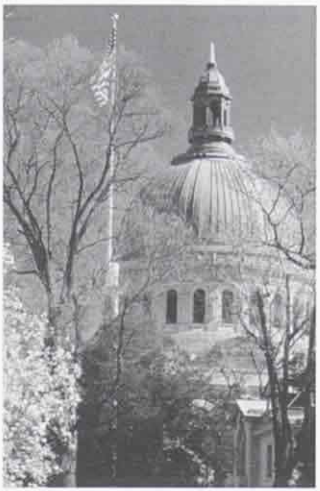
When the upperclassmen return to the academy in late August to begin the academic year, you begin a routine that becomes very familiar during your four years. A typical weekday schedule looks something like this:

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.	Morning meal
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
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.	Evening Meal
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.

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.

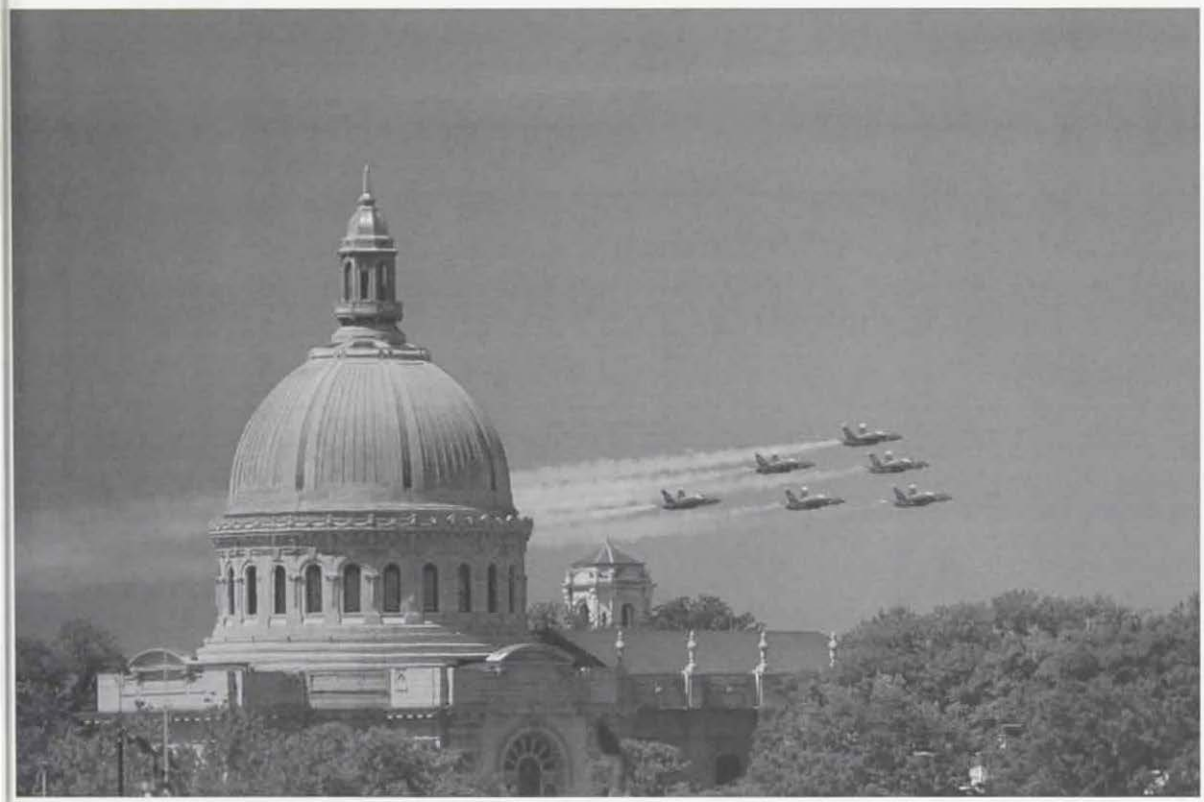
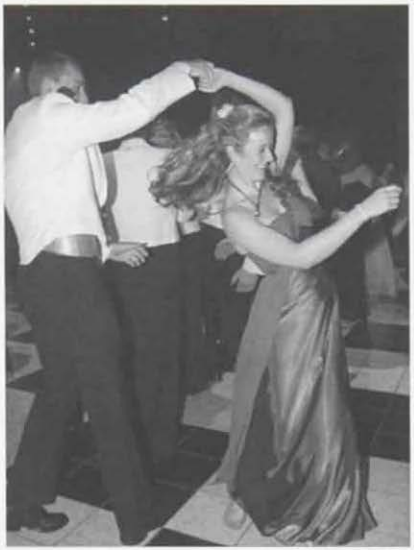


Photo courtesy of Dick Sweeney

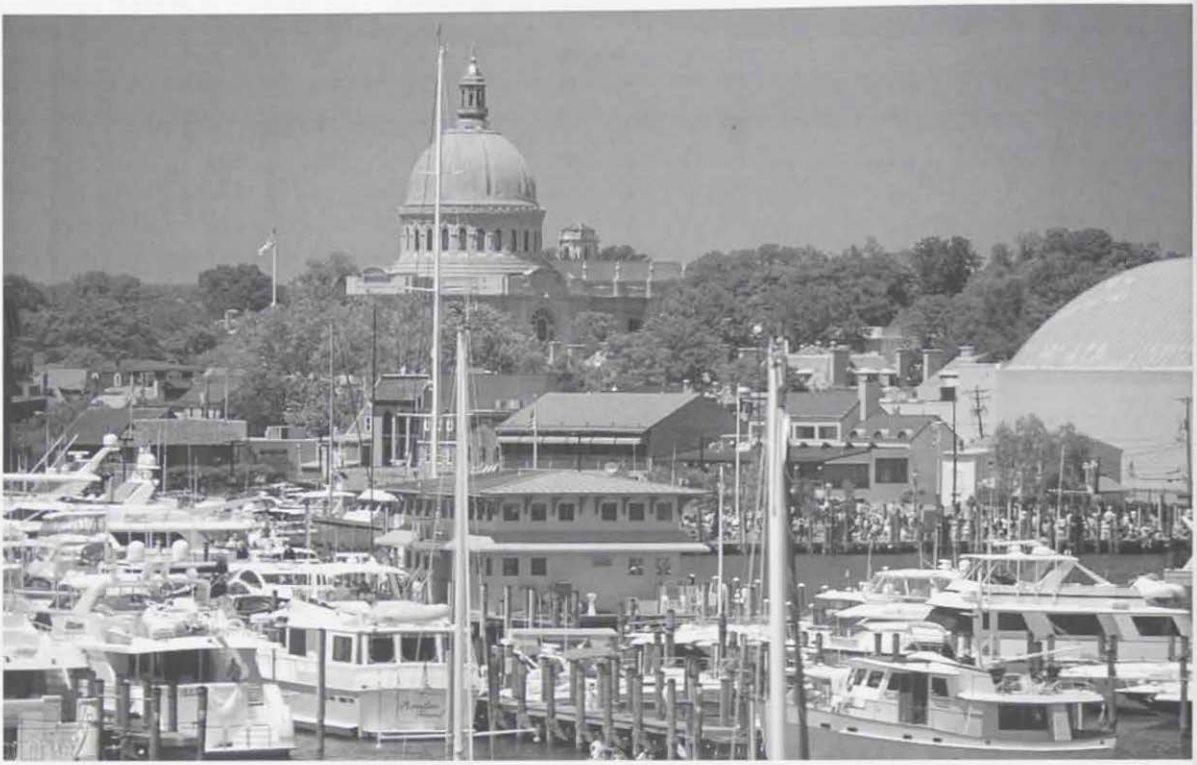
Extracurricular Activities

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
Art Club
Association of Computing Machinery
Astronomy Club
Baptist Student Union
Bill the Goat (Two-legged)
Black Studies Club
Campus Crusade for Christ
Campus Girl Scouts
Cannoneers
Catholic Choir
Catholic Midshipmen Club
Catholic Daughters of America
Cheerleading
Chemistry Club
Chess Club
Chinese Culture Club
Color Guard
Dance ClubDebate
Dolphin Club
Drum & Bugle Corps
Fencing Club
Filipino American Club
French Club
German Club
Glee Club Musical
Golden Key National Honor Society
Gospel Choir
High Powered Rifle Team
International Midshipmen
Japanese American Club
Jewish Midshipmen Club
Joy Bright Hancock Group
Judo
Jui Jitsu
Korean American Midshipmen Club
Labyrinth
Latin American Studies Club
Latter Day Saints
Lucky Bag (yearbook)
Masqueraders
Math Club
Midshipman Action Group
Midshipman African Studies Association
Men's Glee Club
Men's Lacrosse
Men's Soccer
Model United Nations
Muslim Midshipmen Club
National Eagle Scout Association
National Society of Black Engineers
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
Pipes & Drums
Pi Tau Sigma
Protestant Choir
Protestant Midshipmen Club
Semper Fidelis Society
Silent Drill Team
Socratic Society
Society of American Military Engineers
Society of Automotive Engineers
Society of Hispanic Professional Engineers
Society of Naval Architects &Marine Engineers
Surface Navy Association
Tau Beta Pi
Team Bill
Team Philo
Trap and Skeet
Trident Brass
Upsilon Pi Epsilon
Women's Glee Club
Women in Aviation International
Women's Field Hockey
Women's Ice Hockey
WRNV (Radio Station)
YP Squadron
Parachute Club
Infantry Skills Team
Rock Climbing Team
USNA Special Operations Team
Scuba Club
Mountaineering Club
Equestrian Club
ALLIES (Alliance Linking Leaders in Education and the Services)
Adventure Racing
Combat Arms team
Italian Midshipmen Club
LOG Magazine
Russian Studies Club
Alpine Ski Team
Brigade Media Production Group
Middle Eastern Studies Club




NAVY



"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

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 $929.40 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.

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.

"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

- 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.

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. Emergency dental treatment if required is available 24 hours a day, 7 days a week by an on-call USNA Dental Clinic Dentist.

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.

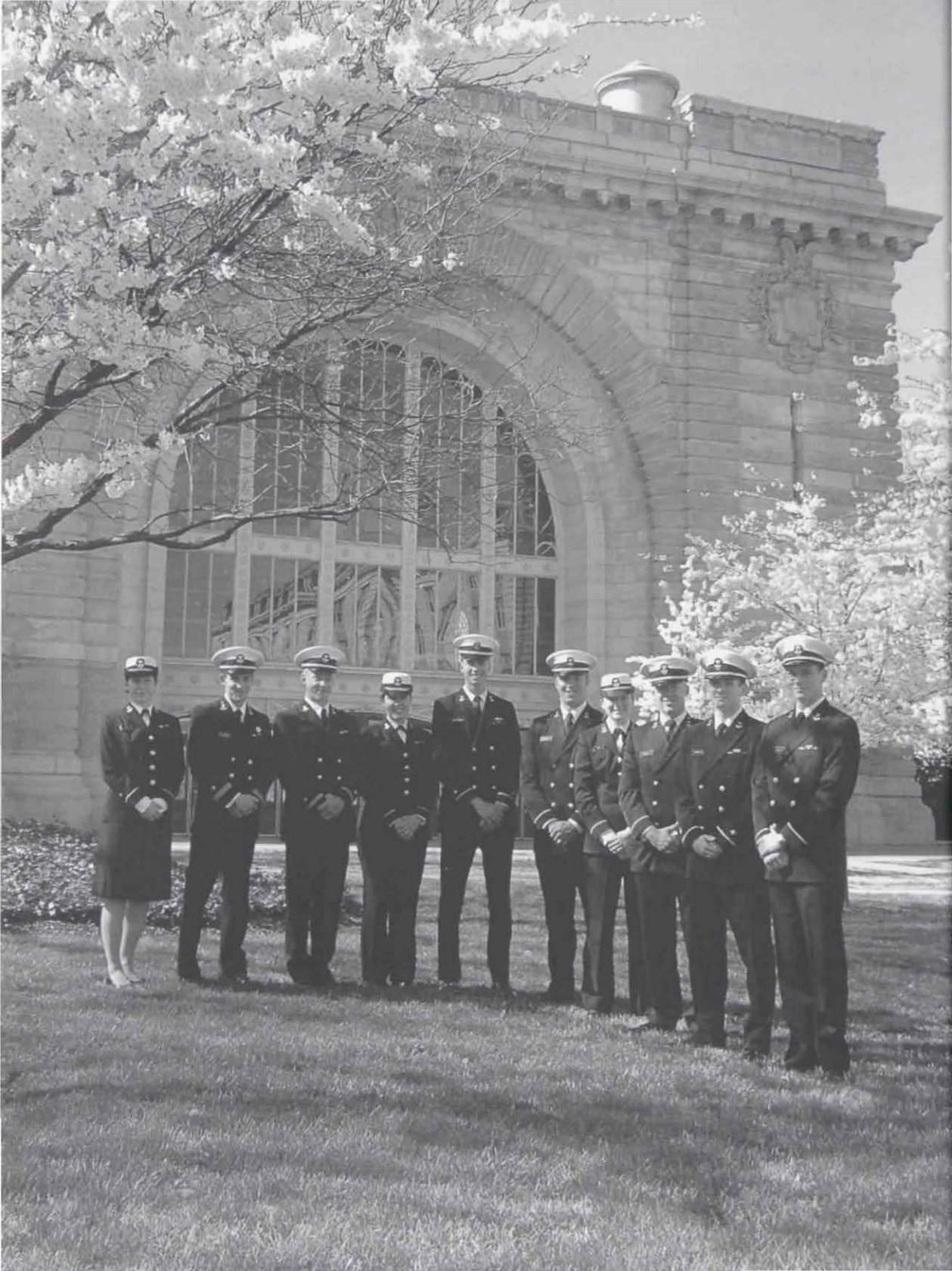
Legal Assistance

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.

"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 critically, solve increasingly technical problems in a dynamic, global environment, and express conclusions clearly.

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

- 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 Middle States Commission on Higher Education, 3624 Market St., Philadelphia, PA 19104, (267) 284-5000; web address: info@msche.org. 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 and information technology major are accredited by the Computing Accreditation Commission of ABET, Inc., 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 eight selected majors graduate with honors.

Academic Dean and Provost

Andrew Phillips returned to the U.S. Naval Academy as the chief academic officer in 2009 after having served as Associate Vice Chancellor for Academic Affairs and Dean of Graduate Studies at the University of Wisconsin – Eau Claire. At UW-Eau Claire, Dr. Phillips was responsible for providing institution-wide leadership for the university's academic programs, for personnel matters, for establishing and supporting graduate programs, and for developing and guiding the university's contribution to economic development throughout the state of Wisconsin.

Dr. Phillips began his academic career as a civilian faculty member in computer science at the U.S. Naval Academy in 1988. In 1998 he moved to UW-Eau Claire to serve as department chair in computer science, a position he held until he become the Associate Vice Chancellor for Academic Affairs and Dean of Graduate Studies in 2004. Dr. Phillips has been a program evaluator for ABET, Inc. since 1997, and he was a member of its Computing Accreditation Commission from 2004-2009.

Dr. Phillips is a 1984 graduate of the Pennsylvania State University, and earned his master's (in 1986) and doctor of philosophy (in 1988) degrees, both in Computer Science, at the University of Minnesota.

"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

It's hard to get lost in the classroom at the Naval Academy. Our philosophy of education stresses attention to individual students by highly qualified faculty members who are strongly committed to teaching. Classes are small, with an average size of about 18 students. Even the core courses required of all midshipmen are taught in sections about this size, so that midshipmen receive individualized attention from their instructors. In science and engineering courses, the same professor who lectures in the classroom supervises experiments in the lab. This practice contrasts sharply with many universities, where senior faculty 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 faculty is an integrated group of nearly 600 officers and civilians in roughly equal numbers. This composition is unique among service academies, and dates from the earliest days of the Naval School when three civilian teachers joined four Navy officers in the first faculty in 1845. Officers typically rotate to the Academy for two-to-three-year assignments, bringing fresh ideas and experiences from operational units of the Navy and Marine Corps. They can also explain how studies at the Academy apply in the fleet and the field. A cadre of officer faculty with doctorates adds 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. All career civilian faculty members have doctoral degrees, and many of them are leading scholars in their fields. Working together, our military and civilian instructors form one of the strongest and most dedicated teaching faculties of any college or university in the United States.

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 advises the Academy's senior leadership on faculty and curriculum matters. The Senate consists of approximately 30 military and civilian representatives from the Academy's academic departments and divisions. The Senate usually meets twice a month during the academic year.

Improving Yard-wide communication is an important Senate function. Senior Academy administrators are ex-officio members of the Senate and routinely address the membership on issues of current interest.

Academic Advising

Midshipmen receive ample assistance in planning their academic programs. The academic advising system has two stages. During their first summer at the Academy, each company of new midshipmen is assigned two faculty members as their academic advisers. Each plebe receives academic counseling—and basic study skills instruction—before the start of the academic year. Advising continues as often as necessary throughout the year. After academic majors are selected in the spring of plebe year, midshipmen are assigned permanent faculty advisers in the academic department of that major. Professors and company officers are essential and helpful resources in providing academic counseling and advice to midshipmen.

Core Curriculum

In four years at the Naval Academy, midshipmen are required to take certain core courses to make sure they are well prepared for the principal career choices available to Navy and Marine Corps 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 for virtually any career path in the operating forces of our country's naval services.

During the first year at the Academy, all courses are part of the required core curriculum. These required courses form the foundation for the more advanced courses, core and major, 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. Courses in your academic major also prepare you for advanced professional training and postgraduate education, which are expected of nearly all naval officers.

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 ready for calculus take a pre-calculus course that does not count as part of the minimum mathematics requirement.
- Chemistry I — This foundation science course includes two hours of laboratories each week.
- U.S. Government and Constitutional Development — The foundation of American democracy.

- Preparing to Lead – Baseline course for leader development; introduces basic concepts of self-knowledge, self-leadership, and leading others.
- Rhetoric and Introduction to Literature I — Most plebes take this class; some will start with a practical writing course that prepares for this class.
- Fundamentals of Naval Science — The basic elements of shipboard operation, organization and propulsion.

Plebe year, second semester — 18 credit hours

- 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.

A few midshipmen who give evidence of the ability to learn a critical language (Arabic, Chinese, Japanese or Russian) may be selected to begin study of the language in plebe year. This is arranged by postponing the government and naval history courses.

Advanced Placement

More than half the midshipmen 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.
- College Entrance Examination Board Achievement and Advanced Placement tests.

During Plebe Summer, all entering midshipmen take placement examinations 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, midshipmen receive academic counseling from their faculty advisers to help them understand their 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 to complete professional courses and training. (Service Academy Exchange and International Study Abroad programs are exceptions.)

Majors Program

At the Naval Academy, the academic program is focused especially 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 in each warfare community of the Navy and Marine Corps.

While the majority of midshipmen will choose their majors, the needs of the Naval Service take precedence. For the Naval Academy Class of 2013 and beyond, at least 65% of those graduates commissioned into the U.S. Navy must complete academic majors in science, technology, engineering, or mathematics disciplines. This institutional requirement applies as well to NROTC programs at other colleges. 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, the aerospace engineering major has tracks in aeronautical engineering and astronautical engineering reflecting the Navy's interest in atmospheric and spatial flight. Minors in French, German, Spanish, Russian, Japanese, Arabic and Chinese 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 first class (senior) year. Following their selection to the program at the end of their junior year, Trident Scholars conduct year-long independent research in an area of their interest, working closely with a faculty advisor who is an expert in the area that the Scholar has chosen to investigate. 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 report their findings of national conferences related to their field. Current Trident Scholars come from many different majors and research topics that range from "Analysis and Optimization of Vortex Oxidizer Injection in a Hybrid Rocket Motor System," and "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 program 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 are generally offered immediate, one-year graduate education 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," and "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 Physics Laboratory. Up to 20 midshipmen can participate annually, starting graduate work during their first class 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.

Academy-Wide Seminars, Research Projects and Interdisciplinary Courses

In addition to the Trident Scholar Program described on the previous page, every department offers research project courses, usually in the first class year year, available to most students. This is consistent with the Naval Academy's emphasis on project-based learning and "learning by doing." The high concentration of defense-related laboratories near Annapolis increases opportunities for midshipmen to become engaged in research relevant to the Naval Service.

In every semester, midshipmen can find a wealth of special seminars with prominent invited speakers on subject matter as varied as engineering systems under developed for the Navy and Marine Corps or regional politics in Africa or comparative culture. The proximity of the Academy to two major cities, Baltimore and Washington, D.C. provides a vast array of educational opportunities to supplement classroom learning.

Faculty from two or more disciplines at the Naval Academy find common areas of interest and do joint scholarly work or teach courses that are interdisciplinary and engage midshipmen from different majors.

Academic departments may offer seminars and individual research projects to upperclassmen on the following basis:

Seminars and Special Topics:

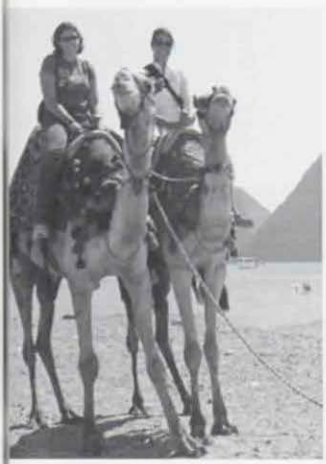
XX 481 and XX 482	1-0-1
XX 485 and XX 486	3-0-3 Advanced topics

Research projects:

A creative project in the student's field of interest. A faculty adviser must approve and monitor each project. *Prerequisite: described in the Academic Dean and Provost Instruction 1531.79.*

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.



Naval Academy International Program Office

Developing foreign language and regional knowledge skill sets is the third core competency the Naval Academy seeks to instill in its graduates, along with ethical leadership and a strong technical foundation in science, mathematics, and engineering. The International Program Office (IPO) helps provide a focused approach to developing midshipman international awareness. The IPO is the principal point of contact, central coordinating office, and source of expert assistance for all international engagement. This includes foreign travel, visitor coordination, and student and faculty exchanges. The IPO focuses especially on developing midshipman opportunities that reinforce their capabilities in foreign languages and regional knowledge—particularly when these can be combined with Navy and Marine Corps theater security cooperation activities. Examples include semester study abroad at foreign military academies and civilian universities, summer education and cultural immersion opportunities, professional training aboard foreign navy vessels, sail training ships, and short-duration orientation visits. At least one quarter of each graduating class can expect to have a significant language or cultural awareness experience during their four years at the Academy.

Facilities

From wind tunnels to state-of-the-art chemistry labs, the Naval Academy has outstanding facilities and equipment in every phase of its program. Classrooms, labs and athletic facilities provide modern, well-equipped 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
- computer network defense and attack facilities

Computers

The Naval Academy has been an educational leader in the use of computer technology since the 1960s. Today information technology is a mission-critical resource and the Academy strives to be 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 embedded in 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 give the Academy network 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 with 24/7 video and data communications to each midshipman desk. Midshipmen are well equipped to profit from this environment. All midshipmen 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.

Nimitz Library

The Nimitz Library includes a collection of more than 615,000 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 (*www.usna.edu/Library*), including its web catalog and an extensive number of electronic journals, books 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, and a coffee bar.

In close collaboration with other academic departments, Nimitz Library conducts a vigorous program of information literacy, educating students about how to obtain, use, and evaluate recorded knowledge as part of the research process.

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

Writing Center

Open to all midshipmen, the Writing Center exists to help those needing writing assistance. 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 throughout the academic day. Prior appointments are not necessary.

Class of 1963 Center for Academic Excellence (CAE)

All midshipmen have access to the CAE, which offers academic advising services and learning skills classes. Students who encounter academic difficulty during plebe year are referred to the CAE; here they can 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 to interested midshipmen several times a year. The CAE also coordinates the Plebe Advising Program; individual faculty members serve as the advisors for a company of plebes during both plebe summer and academic year.

A part of the CAE, the Midshipman 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 installation and maintenance, and video broadcasting.

Resources Afloat

The fundamentals of seamanship, navigation and naval operations are taught in laboratories afloat on the Academy's 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:

- 21 44-foot sloops;
- eight 30- to 66-foot ocean racing yachts;
- one J/22; one J/24: one Sonar;
- 22 420 dinghies, three Interclub dinghies, three Vanguard 15s;
- 21 FJ dinghies;
- 30 Navy 26 keelboats; and
- 50 Lasers

The Naval Academy's sailing program is 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). OSTS qualifies midshipmen to sail one of the Academy's 44-foot sloops offshore during summer cruise. 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 promote a working knowledge of modern naval operations and technology. Courses in leadership, ethics and military law help prepare for leadership responsibilities as an upperclass midshipman and a commissioned officer. Physical education teaches 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, psychology, sociology, anthropology, philosophy, ethics and military law.

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 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. Plebes are graded in:

- 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 — midshipmen are required to meet a 3rd class swim qualification to pass the class. Additional skills for service selection specificity and grade include 400-meter swim (11 minutes maximum); 50-meter sidestroke (seven to 11 strokes per 25 meters); 3 to 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 — midshipmen are tested and graded based upon their ability to meet Navy SWO, and Aviation aquatic requirements and Marine swim requirements. The Physical Education Department provides a letter to each service community recommending those midshipmen who have met the service selection aquatic and swim requirements.
- 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.

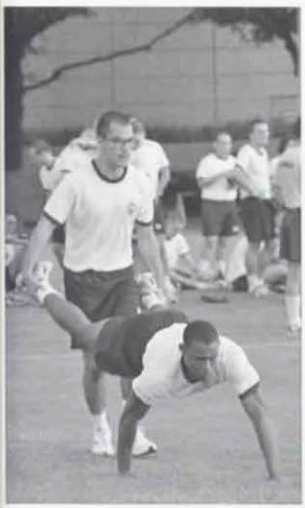
First Class Year

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.



In addition to the above requirements, all midshipmen are regularly required to pass the *Physical Readiness Test.* The PRT consists 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

Summer training events are specifically sequenced into the Naval Academy's four-year education and training plan and reinforce your experiences in the classroom, on the athletic field, and in Bancroft Hall. The focus of your summer training is Fleet alignment. Each summer you will spend approximately four weeks immersed in the Fleet, maximizing your exposure to Navy and Marine Corps personnel, operations, and training.

Third class summer

Your cruise onboard a surface ship or submarine provides you a snapshot of a "day in the life" of Fleet enlisted personnel. You will become part of the crew, taking part in ship's operations and drills and standing underway watches. This opportunity allows you to experience the lives of the men and women that you will lead after commissioning.

Second class summer

You will complete Professional Training of Midshipmen (PROTRAMID), a program introducing you to the missions, equipment, and people of the major Navy branches and the Marine Corps. In one action-packed summer, you fly in Navy aircraft, dive in a nuclear-powered submarine, drive Navy ships, and participate in Marine Corps combat training.

First class summer

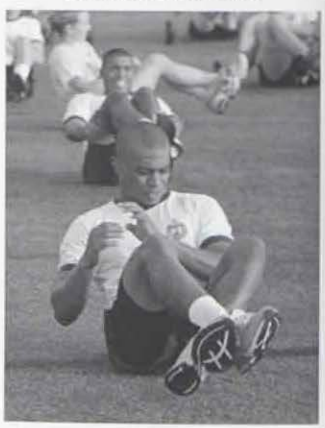
In the final summer, you get a chance to act as a division officer in training, interacting with a Wardroom and the Chief Petty Officer. Warfare cruise options are surface, submarine, aviation, Special Warfare (SEAL), and Explosive Ordnance Disposal (EOD) cruises, as well as Marine Corps training (Leatherneck and Marine Air-Ground Task Force). This cruise experience will help you decide upon your warfare community preferences prior to service assignment during your final fall semester.

Other summer training opportunities

In addition to a Fleet training event, you will complete another four-week summer training event providing you professional development as a future officer. These opportunities include:

- Demonstrating leadership ashore with assignment to Naval Academy and Naval Academy Preparatory School instructional details or Naval Academy Summer Seminar detail.
- Demonstrating afloat leadership and mariner skills on USNA Yard Patrol craft or Navy 44-foot sailboat cruises.
- Overseas (international) training, such as language studies, cultural studies, and exchange cruises with foreign navies.
- Academic summer school to make up previous unsatisfactory performance in the classroom or to get ahead in curriculum requirements for your major. Summer school is normally done in lieu of taking summer leave and is not designed to replace the Fleet or professional development training events.

Being at the Naval Academy has trained me to accomplish more in a day than I ever thought possible.
—Midshipman 2/C Jordan Rusk, Class of 2012



Leadership Development

The purpose of the United States Naval Academy is to grow, shape and motivate leaders of character for the naval service 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 ultimate goal is to develop leaders by integrating 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. The the four-year developmental program produces graduates who:

- possess fundamental knowledge of human behavior and the dynamic science and art of leadership in the military;
- understand midshipman/junior officer leader role responsibilities and values;
- demonstrate analytical and critical thinking related to leadership in the military;
- apply elements of personal character, ethics and the responsibilities of military officership;
- exercise essential individual, interpersonal and organizational leader skills and abilities; and
- express motivation for continued leader development and military officership.

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 Major Christopher Bronzi, USMC (*Courage*); Admiral Charles Larson, USN (Ret.) (*Navy Core Values*); Captain Gerald Coffee, USN (Ret.) (*Honor*); MGEN Charles Bolden, USMC (Ret.) (*Commitment*); and Ms. Nesse Godin, Holocaust Survivor (*Surviving the Holocaust*).

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.
—1ST 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)
I = No Value (Incomplete)
W = No Value (Withdrawn)

Grades are averaged using a weighted semester hour system called the quality point rating or QPR. The 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 a semester SQPR of at least 3.4 with no grade of D, F, I in any course; grades of A in conduct and A in military performance, and A or B in physical education and A or B in the Physical Readiness Test.

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

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

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 or information technology 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.

In addition, the midshipman's major is designated on the degree for earning a CQPR of at least 2.0 in the major.

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.

Advanced Education

Postgraduate education is encouraged for all naval officers and is virtually a requirement for professional advancement in the changing, complex world of today's Navy and Marine Corps. 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, Virginia. 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 a Navy and Marine Corps career. Naval Academy graduates can earn advanced academic degrees in several areas besides the Voluntary Graduate Education Program (VGEP) discussed on page 59. Most officers are automatically considered for graduate school when they complete their first duty assignment. If selected, they can enter master's degree programs at the Naval Postgraduate School in Monterey, California, 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

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.
—Ensign Chelsea Wright, Class of 2010

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.

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.

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.

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

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:

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?
—LTJG Erica Reid-Dixon, USN, Class of 2008

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. Forty-six midshipmen have won the Rhodes Scholarship since 1930, when Navy participation began. There have been 24 Marshall scholars since 1981.

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

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

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.

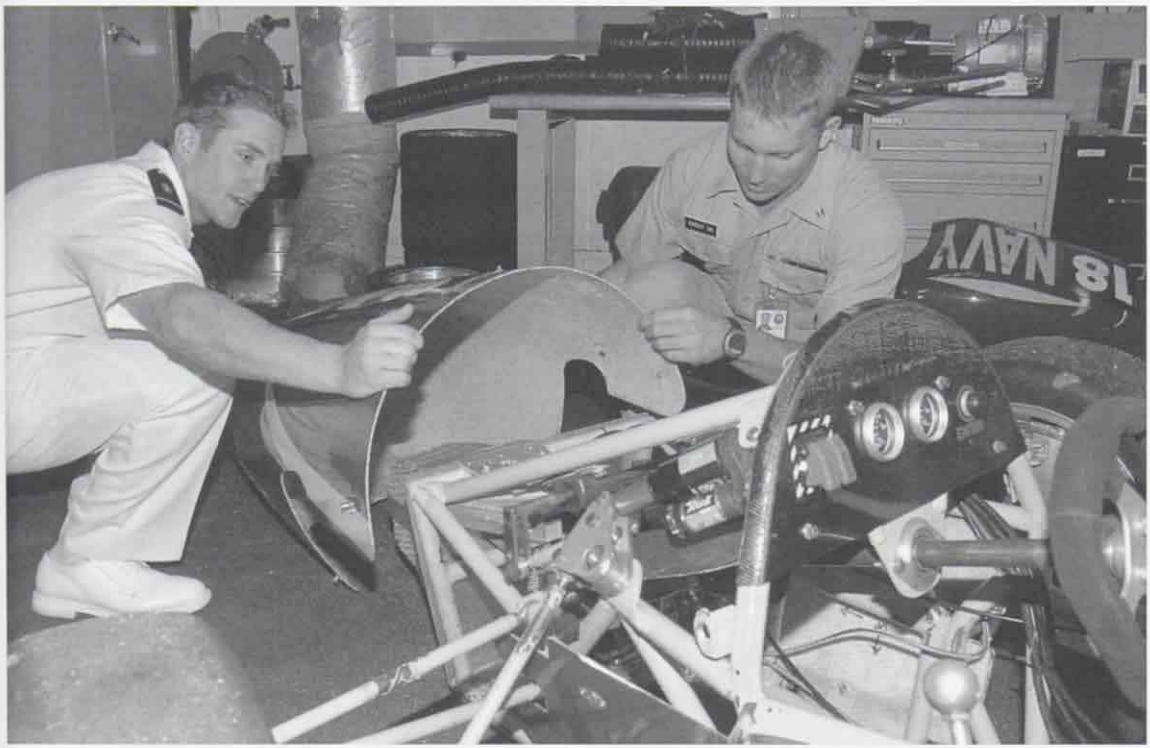
Hertz Fellowship (Fannie and John Hertz Foundation) for graduate study in the applied physical sciences at a choice of 27 universities.

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.

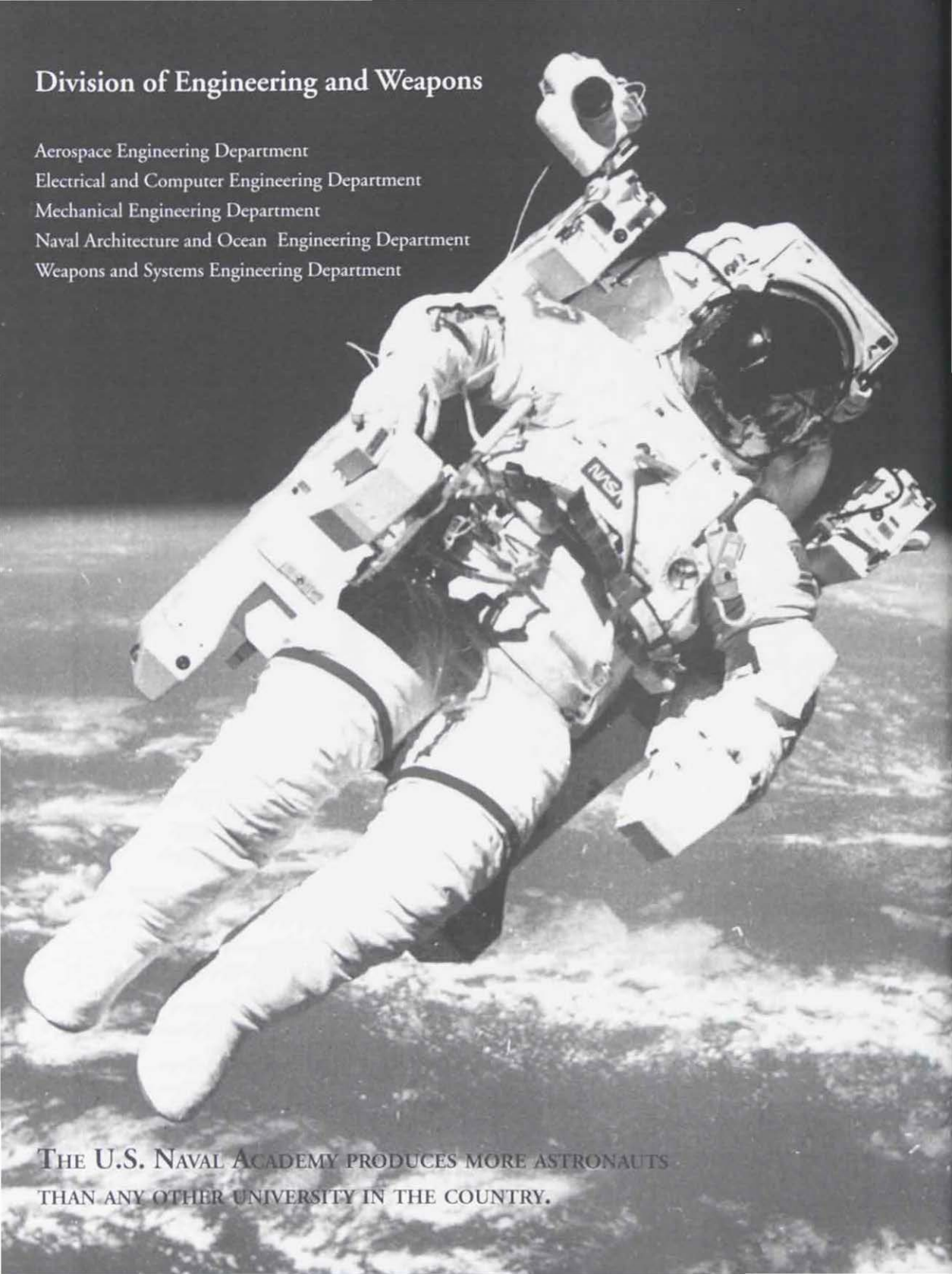
Immediate Graduate Education Program (IGEP) — 14 submarine officers in the Bowman Scholar Program each year, starting in June or July following graduation from the Naval Academy. Graduates selected for IGEP complete a one-year technical master's degree at the Naval Postgraduate School.

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 and Computer Engineering Department
Mechanical Engineering Department
Naval Architecture and Ocean Engineering Department
Weapons and Systems Engineering Department



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 naval 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 study aerospace engineering topics in aeronautics or astronautics tracks infused with airplane or spacecraft design studies.

While graduates of all majors are prepared for careers in naval aviation, the aerospace engineering major is intended for those who are fascinated by flight and want to understand the technology enabling air and space flight.

The program embraces contextual learning, whereby student engineers learn the business of engineering by behaving as engineers in progressively more complex design studies. Starting sophomore year with the redesign of small RC airplanes and rockets, students are exposed simultaneously to the technical content and the professional skills necessary in government and industry. From the outset, student engineers will be working in teams to design aerospace systems to suit a mission need, and reporting on their efforts both in formal presentations and reports.

Both tracks culminate with a capstone design course of one- or two-semester duration, allowing midshipmen to apply their engineering knowledge in the design and construction of an air or space flight vehicle, usually for clients external to the Naval Academy. Design/Build activities and engineering science courses are served by outstanding lab facilities including high and low speed wind tunnels, machine shop, composite lay-up facilities, and spacecraft operation and fabrication labs.

Graduates from the aerospace engineering major are fully prepared to undertake postgraduate education programs in engineering disciplines. Naval officers with degrees in aerospace engineering are commonly 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 Naval Network Warfare Command, the Navy Space Cadre, and NASA's Astronaut Office.

Curriculum Requirements (in addition to the requirements of plebe year)
Professional: NE203, NL300, NL400, NN200, NS300, NS42X;
Mathematics: SM212, SM221;
Physics: 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 sequence include the earth's atmosphere, the space environment, aerospace structures, atmospheric flight, space flight, attitude dynamics, 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. Fall 2011-2012. *Prereq: SM122 or SM162.*

EA204 Principles of Aerospace Engineering II (2-2-3). Second course of a two-course sequence covering the fundamentals of aerospace engineering. See EA203 for the topics covered. Spring. *Prereq: EA203 or approval of department chair.*

EA301 Aerodynamics (3-0-3). Covers essentials of fluid mechanics and topics in aerodynamics including potential flow and thin airfoil theory. Fall 2011-2012. *Prereq: EA203 and SM212.*

EA303 Wind Tunnel (1-2-2). A laboratory course in wind tunnel test techniques. Fall 2011-2012. *Prereq: None; 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 layers. Spring. *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. Fall 2011-2012. *Prereq: (EA203 and EA204); Coreq: EM319.*

EA308 Engineering Analysis (1-2-2). Applications of numerical theory and analysis to relevant engineering problems is 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. Fall 2011-2012. *Coreq: SM212.*

EA322 Structures for Aerospace Engineering (3-2-4). Fundamentals of analysis and synthesis of air and space vehicle structures. Maneuver load factors and factors of safety. Introduction to linear elasticity and strain energy. St. Venant's theory of torsion in solid and thin-wall sections. Uniaxial and biaxial beam flexure stresses and deflections. Shear flow in torsion and flexure. Combined bending, torsion, and axial loading of thin-wall, stiffened structures used in aerospace vehicles. Basics of finite element stress and deformation analysis. Elastic buckling of columns and buckling load relations for plates and conical shells. Basic fracture mechanics and fatigue concepts. Laboratory and computer work integrated to enhance understanding and provide practical insight. Spring. *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. Spring. *Prereq: EA301 and 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. Fall. *Prereq: EM232 or (SM212 and SP212).*

EA364 Spacecraft Attitude Dynamics & 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. Fall 2011-2012. *Prereq: EA362 and ES410.*

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. Spring. *Prereq: EA305 or equivalent course.*

EA400 Introduction To Aeronautics (3-2-4). 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. Fall 2011-2012. *Prereq: SM122 or SM162.*

EA401 Aircraft Performance & Design (3-0-3). The basic principles for lift and drag calculations are extended to entire flight vehicle analysis. Static and dynamic point performance analysis. Introduction to energy methods with selected optimum climb and trajectory problems. Mission analysis and carpet plots leading to design selection criteria. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: EA304.*

EA414 Airplane Simulation and Control (3-0-3). Implementaton of linear and nonlinear 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. Spring. *Prereq: EA413; Coreq: ES410 or equivalent.*

EA417 Elements of Flight Test Engineering (2-2-3). A lecture and laboratory course designed to provide practical application 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. Spring. *Prereq: EA401 and EA413 and approval of the department chair.*

EA421 Aerospace Structures II (3-0-3). Introduction to the finite element methods of structural analysis as applied toatmospheric flight and space flight vehicles. Topics include formulation of the element stiffness matrices, assembly of the global structural matrix, formulation of equivalent loads, energy methods and matrix equation solution methods. A design project using a finite element computer program is carried out. Spring. *Prereq: EA322.*

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. Spring. *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. Spring. *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. Spring. *Prereq: EA304.*

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

EA429 Flight Propulsion (2-2-3). The principles of fluid dynamics and thermodynamics are specialized to the problem of propulsion of aircraft. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: 1/C standing in aeronautical track.*

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. Spring. *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. Fall 2011-2012. *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. Fall. *Prereq: EA362.*

EA463 Space Operations (3-0-3). Description: 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. Spring. *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. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: None; Coreq: EA465.*

EA469 Special Space Craft Design (1-4-3). This course, in conjunction with EA470, provides a two-semester spacecraft design program for selected midshipmen. Fall 2011-2012. *Prereq: 1/C standing in astronautical track.*

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. Spring. *Prereq: 1/C, astronautical track 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 warfare 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 places special emphasis on individual learning at a lab station to ensure thorough understanding of required skills, and the team approach to solving more open-ended, real-world design problems. Labs are continually updated with leading-edge technology.

The electrical engineering major culminates in the capstone senior design laboratory sequence (EE411 and EE414). In these courses, midshipman majors must integrate the many skills acquired in preparatory courses to be able to design, implement, test, and demonstrate a significant project. Annual prizes include the Steinmetz Prize for innovative work in the electrical and computer engineering design laboratory course sequences, the General Michael W. Hagee Prize for the design team showing the highest standards of military leadership, and the Captain Boyd R. Alexander Prize for the outstanding graduate in the electrical engineering major.

Graduates of the electrical engineering program are well prepared for any of the many jobs they may be assigned in the operating forces of the Navy and Marine Corps. The major also provides an excellent 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 fairly recent, but highly significant and relevant sub-discipline of electrical engineering. Smaller, faster, and cheaper are words that describe the revolutionary changes associated with computer engineering. The computer engineering major closely follows the electrical engineering major for the first year, but diverges 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 is certain to need officers trained in computer engineering to lead in the development, integration, and operation of advanced computer-based systems. The computer engineering major leads to a bachelor of science in computer engineering. The Department is seeking early ABET accreditation of the new computer engineering major by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) at the earliest permissible time.

Computer engineering majors apply classroom concepts in the laboratory throughout the program. They are able to take advantage of the Department's well-equipped laboratories in gaining 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) encouragement of individual learning at a lab station to ensure thorough understanding of required skills and b) reliance on team efforts in solving design problems. Labs are regularly updated with leading-edge technology.

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

Graduates of the computer engineering program are well prepared for any of the many jobs they may be assigned in the fleet and fleet marine force. The major also provides an excellent fundamental background and foundation for continued, more specialized study in computer engineering at the graduate level 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 and Computer Engineering Courses

EC244 Electronics/Electromechanics (3-2-4). This course is intended only for students in the Computer Engineering major and introduces them to electronics and electromechanics. Topics covered include amplifiers, comparators, diodes, voltage regulation, bipolar junction transistors, metal oxide field effect transistors (MOSFETs), single- and three-phase power delivery, ideal transformers, DC motors, and AC generators. Problem solving, laboratory exercises, and circuit design are emphasized. Spring. *Prereq: EE221.*

EC262 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. Fall 2011-2012. *Prereq: None.*

EC361 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 that 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. Fall 2011-2012. *Prereq: EC262 or EE313 or EE332 or EE334.*

EC362 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. Spring. *Prereq: EC262.*

EC404 Operating Systems (3-2-4). This is an introductory course covering fundamental concepts and principles of computer operating systems with emphasis on process management including threads, memory management, file system structures, I/O management, system protection, security and distributed computing. Students will engage in a number of programming projects. The first four weeks of the course is devoted to learning the object-oriented Java programming language. Spring. *Prereq: SI204.*

EC415 Computer Eng 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, and gathers performance data, 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. Spring. *Prereq: EE411 and I/C ECE major or approval of department chair.*

EC436 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. Fall 2011-2012. *Prereq: EE354 or approval of department chair.*

EC462 Superscalar Processor Design (3-0-3). Topics essential to modern superscalar processor design are covered: review of pipelined processor design and hierarchical memory design; advanced topics covering a range of processes, techniques and superscalar computer designs. Spring. *Prereq: EC362.*

EC463 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 digital signal processor (DSP) and how to use assembly 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. Fall. *Prereq: EC262 or EE313 or EE332.*

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, and first- and second-order circuits. Students are introduced to linear integrated circuits such as operational amplifiers and timers. Laboratory exercises where students build and design circuits and use test equipment reinforce course material. Introductory troubleshooting skills and lab notebook maintenance are emphasized. Computer simulation is used throughout the course to support both analysis and design objectives. Fall 2011-2012. *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. Spring. *Prereq: EE221 or EE331.*

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. Fall 2011-2012. *Prereq: Physics II (SP212 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. Fall 2011-2012. *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 mutiplexing techniques. During discussions of each topic, military application and relevance is covered. Spring. *Prereq: (EE301 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-electrical engineering 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 then progresses into the uses of MSI devices and digital arithmetic. Finally, an introduction to assembly level programming and microprocessor/microcontroller based systems design is also provided. Spring. *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 tranformers, 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. Fall 2011-2012. *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 systems, including circuits. Both continuous-time and discrete-time systems are discussed. Computer software is used to model and analyze signals and systems. Fall 2011-2012. *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 Theverin equivalence, natural and forced responses of first-order systems, AC power, and AC three-phase systems. Amplifiers, diodes and transistors are introduced and drive discussion of applications in power regulation and machine control. AC and DC machines are investigated and discussed the in the context of a shipboard environment. Fall 2011-2012. *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 and combinational and sequential digital logic are introduced. Fall, Spring. *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 analyzecombinational and sequential digital logic circuits. An in-depth study of computer networking is included with specific emphasis on the OSI model and wireless systems. Fall 2011-2012. *Prereq: 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 is emphasized. Applications include active filters and oscillators. Spring. *Prereq: EE241 or approval of department chair.*

EE344 Solid-State Power Electronics (3-2-4). The 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. Spring. *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. Spring. *Prereq: EE322 or approval of department chair.*

EE372 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. Fall. *Prereq: Physics II (SP212 or SP222).*

EE411 Electrical & 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 captone 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. Fall 2011-2012. *Prereq: 1/C standing in EEE major or ECE major or approval of department chair.*

EE414 Electrical Engineeing 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, and gathers performance data, 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. Spring. *Prereq: EE411 and 1/C EEE 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. Fall 2011-2012. *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 sup-

port a broad study of the major components of electronic instrumentation systems: sensors, data acquisition, signal conditioning, computer control, and actuators. Fall 2011-2012. *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. Spring. *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 communication 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. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: EE354 or approval of department chair.*

EE434 Wireless and Cellular Communications 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 channel coding. Small group research projects are conducted in lieu of a final examination. Spring. *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). Spring. *Prereq: EE432 or approval of department chair.*

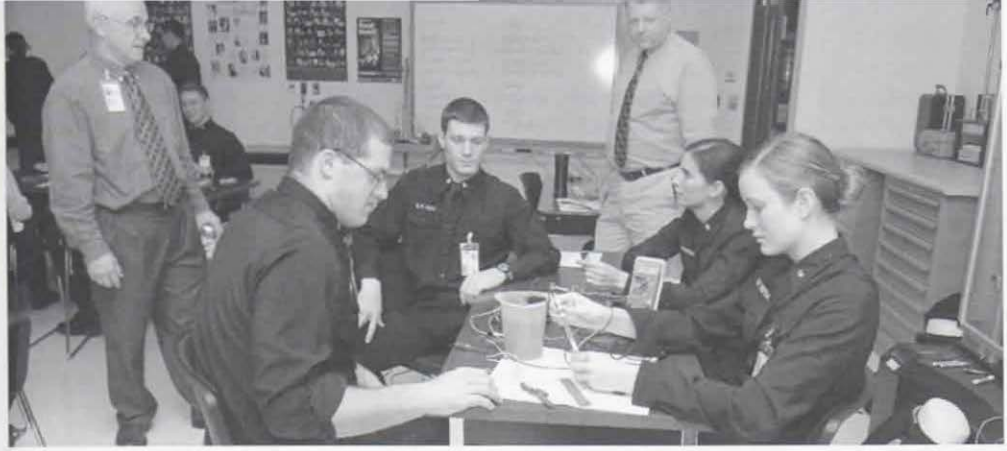
EE451 Electronic Properties of Semiconductors (3-0-3). This course develops an understanding of semiconductor properties and how they determine the performance of semiconductor devices. Hole and electron conduction and charge carrier distribution models are developed. Charge carrier generation and recombination and carrier dynamics leading to drift and diffusion are used to study semiconductor transport phenomena. The p-n junction, bipolar junction transistor, and field-effect transistor are studied in detail. Fall. *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 microelectromechanical systems (MEMS) are also introduced. The laboratory involves an individual student research project. Spring. *Prereq: EE451 or approval of department chair.*

EE461 Microcomputer-Based Digital Design (3-2-4). A principles-based foundation to the concepts and techniques used in analyzing and designing systems using combinations of discrete logic, programmable logic devices, and microprocessors. The student will acquire a detailed understanding of state-machine design; the system bus; the architecture and interfacing of various processor, memory, and input/output (I/O) elements; serial I/O protocols; the architecture and instruction set of a representative microcontroller; assembly-language programming for circuits based on that microcontroller; and the use of interrupts. Emphasis is on concepts that will have long-term value. Spring. *Prereq: EE242 or EE313 or EE332.*

EE471 RF Power Electronics (3-2-4). This course leverages the student's previous study in electronics and electromagnetics 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 semiconductor 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 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. Fall. *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. Fall 2011-2012. *Prereq: EE354 or approval of department chair.*



Mechanical Engineering Department

Mechanical Engineering Major

The mechanical engineering major, fully accredited by the engineering accreditation commission known as ABET, Inc., is the most broad-based of all engineering programs available at the Naval Academy. Current fleet examples of mechanical engineering include the structural mechanics of ships and aircraft; performance of gas turbine engines; conversion of nuclear energy; and advanced weapons systems such as electromagnetic rail-guns and directed energy weapons. These areas of interest require a fundamental understanding of the subjects covered by the mechanical engineering curriculum: solid mechanics, material science, energy conversion, fluids mechanics and the engineering design process. As part of the core curriculum, mechanical engineering majors also take a number of courses in electrical and systems engineering.

Mechanical engineers must be able to design systems that can withstand forces without breaking and/or utilize forces to produce power. Students begin by investigating how forces are distributed within solid structures and learn how to predict deformation and failure. This requires a fundamental understanding of materials and their properties. Mechanical engineers also need to be able to predict the deformation or flow of fluids; and the force that result from the interaction of fluids with solid objects. Students will also study energy and the conversion of chemical, nuclear or thermal energy into mechanical power.

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 developed through a sequence of courses, beginning in the first semester of the sophomore year and culminating in the capstone senior design project, which is a 2-semester endeavor involving teams of students. Each team is expected to design, build and test a mechanical system.

The Mechanical Engineering program prepares its graduates to assume responsibilities in the U.S. Navy and U.S. Marine Corps involving the operation and maintenance of highly technical systems. 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 engineering experience. 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.

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. Fall 2011-2012. *Prereq: None; Coreq: Calculus III and Physics I.*

EM215 Introduction to Mechanical Engineering (1-4-3). This is an overview course for majors only 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. Fall 2011-2012. *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. Fall 2011-2012. *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. Summer 2011-2012. *Prereq: EM211 Coreq: SM212.*

EM300 Principles of Propulsion (3-2-4). A study of the principles of energy conversion, fluid flow and hydraulics applied to naval engineering systems, including the basic operation of steam, gas turbine and internal combustion power plants, as well as heat exchangers, air conditioning, and refrigeration. Summer 2011-2012, Fall 2011-2012. *Prereq: Physics I (SP211 or SP221).*

EM300N Principles of Propulsion/Nuclear (3-2-4). A study of the principles of energy conversion, fluid flow and hydraulics applied to naval engineering systems, including the basic operation of steam, gas turbine and internal combustion power plants, as well as heat exchangers, air conditioning, and refrigeration. This course also covers nuclear power plant propulsion principles. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: None.*

EM316 Thermo-Fluid Sciences I (3-0-3). A first course in thermal systems that covers incompressible fluid mechanics and heat transfer. Topics in fluid mechanics 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. Topics in heat transfer include one-dimensional steady conduction, convection and radiation exchange. Heat transfer emphasis is related to heat exchangers and electronics cooling applications. Fall 2011-2012. *Prereq: SC112; Coreq: SM212.*

EM317 Thermo-Fluid Sciences II (2-2-3). 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. Thermodynamic cycles are covered with specific reference to internal combustion engines, gas turbine engines, steam power plants and refrigeration. Methods for improving the performance of thermodynamic cycles are discussed including regeneration. Fall 2011-2012. *Prereq: EM316 or EM324.*

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. Fall 2011-2012. *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. Spring. *Prereq: EM319 or equivalent.*

EM321 Mechanics and Materials for Aerospace Engineers (3-2-4). EM321 is a first course in materials and mechanics. Topics include: Aerospace material properties; treatments; manufacturing and fabrication processes including jointing; design and selection considerations, including durability repairability 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 intergrated to show the relevance of the topics and to give practical insight to the behavior of aerospace structural materials and structures. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: SP212 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. Fall 2011-2012. *Prereq: EM217 and 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. Spring. *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. Spring. *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. Fall 2011-2012. *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. Spring. *Prereq: EM217 and EM232.*

EM424 Analytical Methods Mechanics (3-0-3). Review of solution methods to frequently encountered engineering problems such as cylindrical and spherical heat conduction, wave dynamics, boundary layers and vibrations. The solutions methods focus on problems encountered in solid mechanics, fluids mechanics and heat transfer. Includes both analytical and numerical problem solving techniques. Fall. *Prereq: SM212.*

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 prgramming, process planning, dimensioning, and tolerancing. Students particpate in a manufacturing project which utilizes CAD/CAM software to design and manufacture a component using CNC machining equipment. *Prereq: I/C engineering major.*

EM436 Mechanics of Composite Structures (2-2-3). Mechanics of Composite Structures is an introductory course that emphasizes the mechanics of structures containing composite materials. Mechanics topics covered include generalized Hooke's Law, lamina constitutive relationships, lamina strength analysis, micromechanics of fiber reinforced lamina, and the mechanics of composite laminates. In addition materials science and manufacturing of composites are covered. A project that requires both the design, manufacture and testing of a composite component or structure concludes this course. *Prereq: EM217.*

EM442 Computer-Aided Thermodynamics (2-2-3). This course covers the thermodynamics and heat transfer concepts associated with heat engines and vapor-compression refrigerators and heat pumps employing computer software to conduct the analysis. The software package allows for faster basic solutions and enables the students to conduct optimization and design activities that clearly illustrate enhancements to both basic gas and vapor cycles, as well as more advanced combined and cascaded cycles. Enrollment limited to General Engineering majors. Students may not receive credit for this course and EM320. Fall, Spring. *Prereq: EGE major and either EM319 or EM317.*

EM443 Energy Conversion (3-0-3). Fundamentals of applied energy systems including types and sources of energy; forms and methods of energy delivery; and the sectors, magnitude, and use patterns of energy consumption. Focusing on the U.S. national energy situation, topics include energy conversion processes in existing and projected power, transportation, heating and cooling systems, with emphasis on efficiency, economic viability, and environmental impacts. Traditional and nontraditional fuels; nuclear energy systems, alternate energy systems, and methods of energy storage. Spring. *Prereq: EM319 or equivalent.*

EM444 Solar Engineering (3-0-3). An introduction to solar energy conversion and utilization. Topics covered include solar radiation, collectors, energy storage, solar heating, solar cooling, photovoltaic converters and wind energy. Fall, Spring. *Prereq: I/C engineering major or approval of department chair.*

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 covered 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. Spring. *Prereq: SP212, EM313.*

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: (a) Design and fabricate 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 components, 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 hands-on, project-based approach to learning about robotics. Fall. *Prereq: EM371 or permission of instructor.*

EM452 Engineering Materials (3-0-3). This course consists of advanced topics in engineering materials, including marine corrosion and design considerations (electrochemistry, corrosion rates, design of protection systems, etc.) and mechanical properties of materials (yield under complex stress state, brittle fracture and temperature effects, fatigue in simple and biaxial stress, and mechanical creep). Review of concepts in solid mechanics (tension/compression, torsion, bending and Mohr's circle) will be included. Enrollment limited to General Engineering majors. Students may not receive credit for this course and EM321, EM371, or EN380. Fall 2011-2012. *Prereq: I/C EGE major.*

EM453 Materials: Processing & 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. Spring. *Prereq: EM313.*

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 experiements which complement the lecture material. Spring. *Prereq: 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. Fall 2011-2012. *Prereq: EM320 and EM324 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 Engineering Design I (2-2-3). The first course in a two-semester capstone design sequence. Topics include the engineering design process, project management, codes and standards, engineering ethics, and computer-aided design. Students form design teams, select a captone design project and progress through the proposal and preliminary design stages of the project. The capstone design project continues in EM472. Fall 2011-2012. *Prereq: EM371.*

EM472 Mechanical Engineering 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. Spring. *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. Gas turbine cycles are studied along with the various components that comprise gas turbine engines such as axial and centrifugal compressors, combustors, axial turbines, intercoolers, reheaters, regenerators and inlet/exit diffusers and nozzles. Future concepts in turbomachinery 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 turbomachinery, combustion analysis and emissions control. The culmination of the course is a final design project. Spring. *Prereq: EM320.*

EM475 Motorsports Engineering (1-4-3). A design course in which the objective is to build a small formula-style race car based on a set of specifications provided by the Society of Automotive Engineers (SAE). Topics include vehicle dynamics, suspension and steering geometry, engine and drivetrain fundamentals, driver interfaces, fabrication technologies and project management. Students can expect significant hands-on fabrication and assembly experience. The vehicle is completed in EM472 in fulfillment of capstone project requirements. Fall. *Prereq: EM371, permission of instructor; Coreq: EM471.*

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. 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, NS300, 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, EM318, EN 200, SM230, plus eight major electives and one free elective.

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 known as ABET, Inc. 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, EM316, EM 317, ES300, ES360;
Major: EN221, EN222, EN247, EN330, EN342, EN353, EN358, EN380, EN455, EN471, EN476, plus two major electives and one mathematics, science or engineering 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 fully accredited by the engineering accreditation commission known as ABET, Inc. 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, EM317, 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 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. Fall 2011-2012. *Prereq: 3/C ENA major.*

EN222 Engineering Mechanics with Marine Applications II (3-2-4). The 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. Spring. *Prereq: EN221.*

EN245 Principles of Ocean Systems Engineering (2-2-3). This course introduces new ocean engineering majors to the general problems and design 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 emphasized. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: ENA major or approval of department chair.*

EN330 Probabilities & 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. Fall 2011-2012. *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. Fall. *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. This course also covers the experimental aspects of marine vehicle resistance and propulsion. Spring. *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. Spring. *Prereq: EM217 or EN222; Coreq: EN353.*

EN380 Naval Materials Science and Engineering (3-0-3). This course addresses the optimal use of materials in ocean systems with emphasis on corrosion prevention, fracture mechanics, and basic materials science. Fall 2011-2012. 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 submarines 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. Summer 2011-2012, Fall 2011-2012. *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, strength of materials and soil mechanics are studied to provide a base for further investigation. Coastal processes including wave action, sediment transport, beach formation 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. Summer 2011-2012, Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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 control systems. Includes thermal energy conversion to power cycles, including internal and external combustion engines, and gas turbines. Topics covered include refrigeration, air conditioning, heat pumps, incompressible and compressible flow, mass and energy balances, and heat exchanger designs. Fall. *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. Fall 2011-2012. *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. Fall, Spring. *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. Fall, Spring. *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 the design of steel, composite, and concrete structures. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: EN380.*

EN447 Autonomous Vessel Design (1-4-3). In this course midshipmen will work as a team to learn and apply the fundamentals of small craft design by performing the design of a small autonomous sail and solar-powered surface vessel. Fall 2011-2012. *Prereq: ENA major or approval of department chair.*

EN448 Autonomous Vessel Fabrication & Evaluation (1-4-3). In this course midshipmen will work as a team to complete the final design, fabricate, evaluate, and develop a small autonomous sail and solar-powered surface vessel. Spring. *Prereq: ENA major or approval of department chair.*

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 selecting from among a set of technically feasible alternatives are studied. Assumptions and implications associated with these decision-making procedures are discussed. Fall, Spring. *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 theoretical studies. Spring. *Prereq: (EN358 and EN455) or (EN461 and EN475).*

EN454 Project Management for Ocean Engineers (3-0-3). The course goal: enhance midshipmen project management skills in engineering related situations using quantitative and qualitative methods. Topics covered include relevant decision theories, statistical analysis, inventory control, network concepts, pert diagrams, critical path methods, and risk management. Fall 2011-2012. *Prereq: 1/C NAOE major or approval of department chair.*

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. Fall 2011-2012. *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. Fall. *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. Spring. *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. Spring. *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. Fall 2011-2012. *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 include 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 presentation. Spring. *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. Spring. *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. Fall 2011-2012. *Prereq: 1/C standing in naval architecture major.*

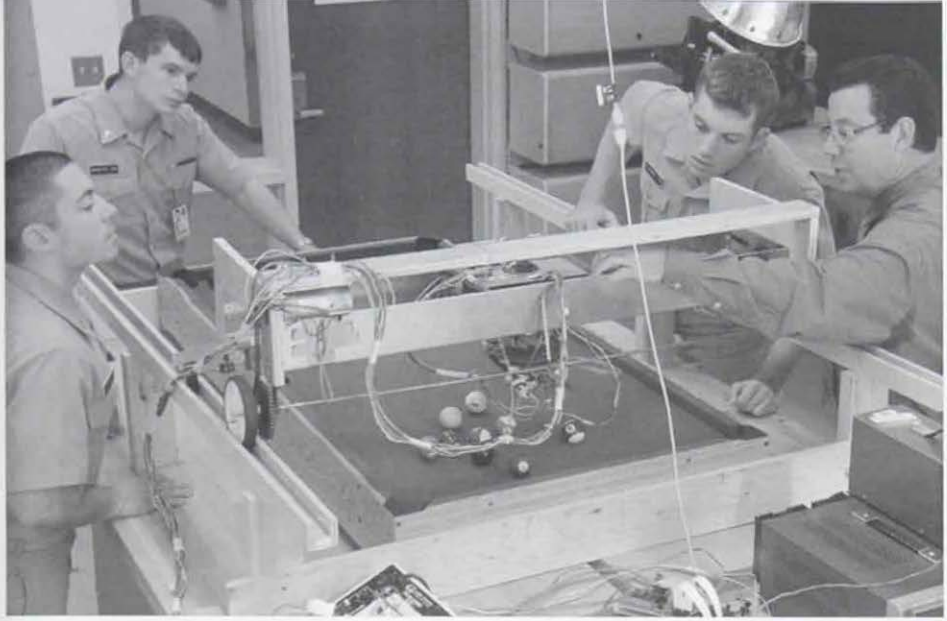
EN475 Ocean Engineering Mechanics (3-2-4). This course investigates the properties of ocean surface waves and the effects of ocean waves on fixed and floating ocean structures. Laboratory experiments are an integral part of the course and include measurements of wave heights, fluid velocities and pressures, wave-induced forces and structure motions in waves. Computational skills are also emphasized both through extensive spreadsheet applications and through programming in MATLAB. Spring. *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. Spring. *Prereq: EN471.*

EN478 Submarine & Submersible Design (3-0-3). An introductory course in submarine and submersible design with topics in undersea vessel development through exploring historical development, buoyancy and stability, resistance and propulsion, mission requirements, auxiliary systems, structural design, construction methods and modern design approaches. Fall. *Prereq: ENA or EOE major.*

EN503H Honors Senior Thesis 1 (1-4-3). This course includes a weekly recitation period which will cover research methodology, literature search, design of experiments, data collection and reduction, report preparation, publication of research, and ethical guidelines for research. In addition, with the guidance of a faculty advisor, students prepare analytical research papers based on a technical topic of their choice. Each student makes an oral presentation of their interim report before the NAOE faculty including their designated thesis committee. Fall 2011-2012. *Prereq: Approval of the department chair.*

EN504H Honors Senior Thesis 2 (0-6-3). With the guidance of a faculty advisor, students prepare analytical research papers based on a technical topic of their choice. Each student makes an oral presentation of their final report before the NAOE Faculty Honors Committee and external readers. Spring. *Prereq: Approval of the department chair.*



Weapons and Systems Engineering Department

Systems Engineering Major

Modern engineering designs, from automobile and spacecraft to missiles and robots, are complex systems of components such as motors, microcomputers, and sensors. Using these diverse components, the Systems Engineer designs a functional whole that meets given specifications and whose behavior is characterized by automatic decision-making. The scope of such designs necessitates that students of the major learn a breadth of topics encompassing electronics, mechanics, and computer programming.

Due to the characteristic automatic functionality of its designs, the core content of the major is the study of feedback control and intelligent sensing. Surrounding this core are many advanced courses in microprocessors, robotics, unmanned vehicles, computer vision, and relevant emerging technologies. To enrich their knowledge of a specific field, students of the major may take a couple of advanced courses from other engineering disciplines as well as mathematics, physics, and computer science. The Naval Academy's Systems Engineering program—rated number on in the country for more than ten years—is accredited by the Accreditation Board for Engineering and Technology (ABET). A bachelor of science in Systems Engineering is awarded; an honors program with a designated honors degree is available for selected students.

Systems Engineers are well-prepared to operate and maintain, particularly, the most sophisticated systems found in today's Navy. Knowledge gained in the major is directly applicable to missile guidance, radar, and propulsion systems. Many graduates go on to industry where they lead and manage interdisciplinary teams of engineers. 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: HH2XY, HH216, and two electives including one at the 300/400 level;
Engineering: EE331, EE332, EM211, EM232, EM318, EM319A, ES300;
Major: ES201, ES202, ES301, ES303, ES304, ES308, ES402, ES403, ES405, plus five major electives.

Systems Engineering Courses

ES201 Introduction to Systems Engineering (2-2-3). This course acts as an introduction to the discipline of systems engineering, focusing on programming, sensors and actuators, and the development and integration of hardware and software solutions to engineering problems. Using a systems-level, project-based approach, the course also ties together the mathematics, science and technological courses from the core, and introduces the student to the basics of technical communication. Fall 2011-2012. **Prereq: ESE/ESEH major or approval of department chair.**

ES202 Principles of Systems Engineering (2-2-3). This second course in systems engineering introduces concepts from control theory, instrumentation, and mechatronics, offering students a practical, hands-on introduction to these topics through the use of projects and laboratory exercises. Spring. *Prereq: ES201.*

ES300 Naval Weapons Systems (3-0-3). An introduction to the theory of weapons systems through a study of the principles of sensor, tracking, delivery and destruction mechanisms. Summer 2011-2012, Fall 2011-2012. *Prereq: Calculus II (SM122 or SM162) and Chemistry II (SC112 or SC151) and Physics II (SP212 or SP222).*

ES301 System Modeling and Simulation (2-2-3). The course introduces modeling of physical systems including mechanical, electrical, and fluid systems. Also introduced are standard model representations, such as transfer functions and state space models, along with numerical methods and simulation software. Includes hands-on hardware laboratory exercises. Fall 2011-2012. *Prereq: ES202 and EM232; Coreq: ES303 or ES303H.*

ES303 Linear Control Systems (3-0-3). Analysis and design of linear control systems in the time and frequency domains. Fall 2011-2012. *Prereq: ES202 and EM232; Coreq: ES301.*

ES303H Honors Linear Control Systems (3-0-3). Analysis and design of linear control systems in the time and frequency domains. This honors section focuses on deeper analysis of the design toolset and includes an open-ended design project. Fall 2011-2012. *Prereq: ES202, EM232, ESEH major; Coreq: ES301.*

ES304 Modern Control Systems (3-0-3). A study of linear systems modeled as continuous-time state equations. Design and analysis of state feedback control systems. Introduction to state estimation and prediction. Spring. *Prereq: ES301 and (ES303 or ES303H); Coreq: ES308.*

ES304H Honors Modern Control Systems (3-0-3). A study of modern advanced control methods for linear systems, including state feedback compensation and state estimation. This honors course focuses on deeper analysis of the modern control toolset and includes an open-ended control design project. Spring. *Prereq: ES301, ES303H; Coreq: ES308.*

ES308 Control Systems Design Laboratory (1-2-2). Applied control systems design. Implementation of analog and sample data controllers in laboratory hardware. Spring. *Prereq: ES303 or ES303H.*

ES360 Control Systems Laboratory (0-2-1). An introduction to the fundamentals and design of automated control systems. The course develops conceptual understanding and intuition through a series of hands-on laboratory experiences. Topics include systems modeling and simulation tools, time response, feedback and system design for response and stability. Analytical, graphical, and computer techniques are used to emphasize qualitative understanding of systems and techniques that are common to all modern weapon systems. Summer 2011-2012, Fall 2011-2012. *Prereq: Calculus II and Chemistry II and 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. Two hours of lecture and two hours of laboratory are normally sceduled for this course. Each team also meets for an additional two hours of project work each week according to a schedule arranged to accommodate all those involved. Spring. *Prereq: ES308 and ES405.*

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. Fall 2011-2012. *Prereq: ES308.*

ES405 Applied Sensors and Actuators (2-2-3). Introduction to sensors and actuators. The course introduces practical aspects of system design with special emphasis on measuring sensor data and controlling motors. Measurement data processing is covered using statistical tools. Principles of operation and various applications are presented for a number of contemporary sensors and actuators. Fall 2011-2012. *Prereq: (ES304 or ES304H), ES308, SM316.*

ES410 Control Systems and Their Application to Weapons (3-2-4). Linear control systems for engineering majors, using analytical, graphical and computer techniques. Fall 2011-2012. *Prereq: Physics II (SP212 or SP222), DE (SM212 or SM222), and Elec Eng I (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. Fall 2011-2012. *Prereq: ES308 or ES410.*

ES418 Optimal Control & Estimation (3-0-3). Analysis and design of control systems and estimators using optimal control theory. Fall. *Prereq: ES304 or ES304H.*

ES421 Introduction to Communications & Information Systems (2-2-3). Introduction to the tools required to study contemporary communications and information systems. The course introduces analog and digital signals and systems and modern processing tools: convolution, correlation, filtering and spectral analysis. Laboratory experiments emphasize practical aspects of building wireless transmitters and receivers. Fall 2011-2012. *Prereq: I/C in engineering major or approval of department chair.*

ES422 Modern Communications & Information Systems (2-2-3). Introduction to modern communication and information systems. The course introduces amplitude and frequency modulation techniques, analog to digital conversion, the fast Fourier transform (FFT) as well as information system theory and coding: error protection and data compression codes and computer networking. Students are engaged in weekly presentations of current technology used in everyday communication devices. Laboratory experiments concentrate on sampling signals, processing them and transmitting information via modems. Spring. *Prereq: ES421.*

ES430 Introduction to Computer Engineering (2-2-3). An introduction to logic operations starting with Boolean algebra and switching circuits up to introductory microcomputer functional organization and control implementation. Laboratory exercises reinforce the theory introduced during lectures, including combinational and sequential logic design with discrete and integrated reprogammable logic devices, and examples of microcomputer control of servo systems utilizing typical interfaces. Fall 2011-2012. *Prereq: None.*

ES432 Microcomputers in Control Applications (2-2-3). A more thorough introduction to the role of the microcomputer as an embedded component in control systems, applying high-level and assembly language programming techniques with a variety of interface hardware. Laboratory exercises reinforce theoretical topics introduced during lectures, including internal timers and interrupts with a different microprocessor system, communications between computers, and analog and digital data handling. Spring. *Prereq: ES430 or approval of department chair.*

ES450 Introduction to Robotic Systems (2-2-3). Fundamentals of robotic systems including historical development, applications, manipulator configuration and design considerations, control principles of robotic systems, fundamental computer vision processing and group design projects. Laboratory exercises utilize networked PCs, various laboratory robot systems, and computer vision systems to investigate theoretical topics introduced during lectures. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: None; 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. Spring. *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. Fall. *Prereq: SI283 or approval of department chair.*

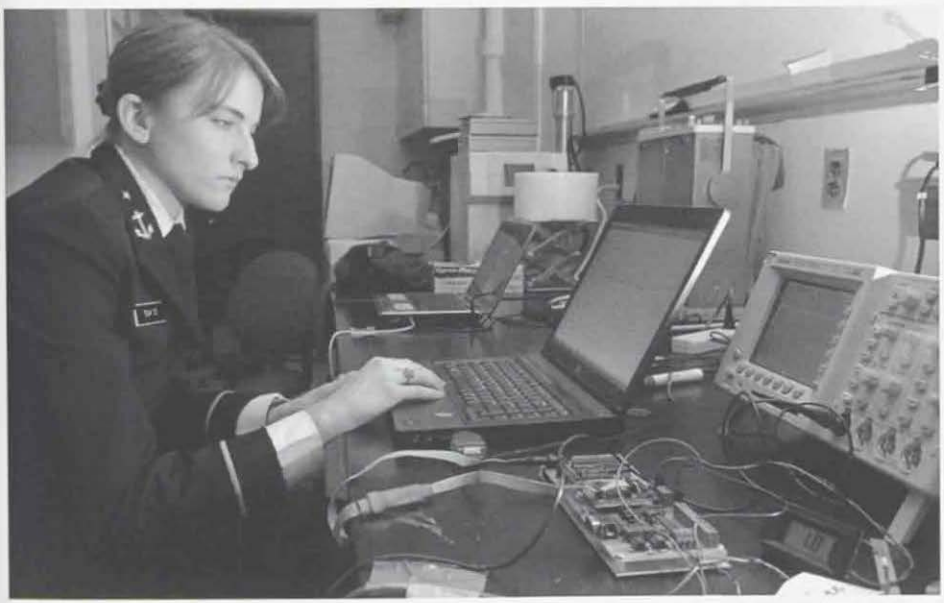
ES456 Autonomous Vehicles (2-2-3). Advanced topics in dynamics, control and estimation as they apply to unmanned vehicles. Introduction to specifics of aerial, marine and ground vehicles. Laboratory exposure to navigation hardware and an open ended project. Spring. *Prereq: 1/C ESE major or approval of department chair.*

ES461 Quantitative Methods for Management (3-0-3). 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. Requires Department Chair approval. Fall 2011-2012. *Prereq: Approval of department chair.*

ES462 Emerging Technologies (3-0-3). Focuses on skills and toolsets for evaluation of new and emerging technologies using a socio-technological 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, cybernetics, etc. Credit cannot be received for both ES462 and ES503. Spring. *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. Spring. *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 analyse state-of-the-art technologies and predict directions of future expansion and application of these systems. Sample topics include nanotechnology, cybernetics, genetic engineering, intelligent highway vehicle systems, etc. Credit cannot be received for both ES462 and ES503. Spring. *Prereq: 1/C ESEH major.*



Division of Humanities and Social Sciences

Economics Department
English Department
History Department
Languages and Cultures 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. Summer 2011-2012, Fall 2011-2012. *Prereq: None.*

FE220 Accounting (3-0-3). This course provides an introduction to the basic principles of accounting. This course will emphasize how general-purpose financial statements communicate information about the business corporation¿s performance and position for users external to management. Approximately half of the course emphasizes how the accountant processes and presents the information and includes exposure to recording transactions, adjusting balances, and preparing financial statements for service and merchandise firms according to established rules and procedures. The remainder of the course examines major elements of the statements of the cash, receivables, inventory, long-lived assets, depreciation, payroll, bonds, and other liabilities and stocks. FE220 is designed for the student who has no prior exposure to accounting. The course covers a wide range of accounting topics. The central objective of the course is to assist students in developing an understanding and appreciation for basic accounting. Cannot be taken for Humanities/Social Science elective. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: FE210.*

FE310 Economic Geography (3-0-3). Economic Geography provides a systematic understanding of economic growth and the issue of finite limits to improve living standards around the world. The course studies population growth, economic development in underdeveloped countries, pollution and resource depletion, food production and agriculture, patterns of land use, economic justice, Foreign Direct Investment (FDI), social development, the role of government and multinational/international commerce. The course will develop an understanding of the link between the world economy and geography in relation to globalization and economic development. Fall 2011-2012. *Prereq: FE210 or permission 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. Spring. *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. Fall 2011-2012. *Prereq: FE210.*

FE314 International Trade and Policy (3-0-3). Study of trade policy, institutions that shape trade policy and the impact of those policies on actual trade patterns, international capital flows and economic conditions and growth in different countries. Covered topics include: different exchange rate regimes and international monetary systems, role of the World Bank and the IMF, protections policies in the form of tariffs, quotas, voluntary exchange restraints and anti-dumping duties, multilateral free trade agreements and regional trade agreements and unions such as NAFTA, APEC and the European Union. Spring. *Prereq: FE210 or FP210 or permission of the Economics department chair.*

FE315 Economics of Developing Nations (3-0-3). Study of the economic characteristics, problems and policies of developing nations, covering economic growth patterns in low income nations, their changing role in the international economic order and the different economic routes being employed toward economic progress. Individual country case studies may also be presented and differences between countries will be analyzed. Spring. *Prereq: FE210 or permission of the department chair.*

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. Fall 2011-2012. *Prereq: FE210 and (SM230 or SM239 or SM219).*

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. Fall. *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. Fall 2011-2012. *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. Spring. *Prereq: FE210.*

FE341 Microeconomics (3-0-3). This course builds upon the fundamentals of microeconomics introduced in FE210, with a particular focus on the optimizing behavior of both firms and individuals. Focus will be not only on learning key microeconomics models, but also applying these models to public policy issues. Fall 2011-2012. *Prereq: FE210 or permission from department chair.*

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. Spring. *Prereq: FE210.*

FE345 Environmental Economics (3-0-3). This course develops guiding economic principles for decision-making in the environmental arena. Important topics include population growth and the environment, the economics of pollution control, measuring environmental benefits, use and management of renewable and non-renewable resources, environmental justice, and the politics of environmental policy. Not offered every year. Fall 2011-2012. *Prereq: FE210 or permission from department chair.*

FE354 Development of the U.S. Economy (3-0-3). Economists, politicians, and the news media often draw conclusions about policies today based on their opinions of what happened in the past. This course will use the tools of economics to rigorously analyze the development and evolution of the United States' economy, markets, insitutions, and standard of living. Topics to be studied may include the American Revolution, slavery, the Civil War, Westward expansion, and the Great Depression. Fall 2011-2012. *Prereq: FE210 or approval of department chair.*

FE400 Advanced Microeconomic Theory (4-0-4). Advanced topics in modern microeconomics. Topics may include dynamic analysis, risk and decision making under uncertainty, general equilibrium analysis, welfare economics, game theory and strategic behavior, principal-agent problems, collective action and social dilemmas, and rational and "irrational" choice. Fall 2011-2012. *Prereq: FE331, FE341.*

FE405 Advanced Macroeconomic Theory (4-0-4). This course is designed as an advanced treatment of modern macroeconomics and policy analysis. Throughout the course we emphasize the role that imperfections play in the labor, product and financial markets in short, medium, and long run macroeconomics. The players in the economy—the central bank, governments, employers, employees, and financial market institutions—operate strategically within a set framework. The model that we will develop and use is a mainstream monetary macro model used in current research and central banks for policy analysis. Fall 2011-2012. *Prereq: FE312, FE331, FE341.*

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. Discussed topics include economic models of growth, impact of physical and human capital investment, poverty and population growth, trade and globalization, government institutions, international capital flows, foreign aid , growth during times of structural change and reconstruction investment in war-torn societies. Individual country case studies may also be presented and social, political and historical differences between countries will be analyzed. Fall. *Prereq: FE312.*

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. Fall 2011-2012. *Prereq: FE312 or FE341.*

FE422 Labor Economics (3-0-3). This course analyzes theories of labor markets and evidence on whether and how labor market theories successfully analyze outcomes. The core material explores labor demand by profit-maximizing firms, labor supply decisions made by rational workers, and equilibrium patterns of employment and wages. Topics may include: the analysis of human capital, migration, the economics of discrimination, effects of unions on employment and wages, effects of legislation (such as minimum wages and payroll taxes) and recent trends in wage inequality. Fall 2011-2012. *Prereq: FE341.*

FE431 Public Finance (3-0-3). This course examines the role of government in a market economy including the use of government expenditures and taxation to change the allocation of resources and/or to change the distribution of income. Emphasis is given to the formation and analysis of public policies in education, health care, social security, welfare, and the environment. Proposals for tax reform and how to address long-term fiscal challenges are analyzed. This course counts as a 400-level elective for economics majors (FEC) and as an economics major elective for the quantitative economics major (SQE). Fall 2011-2012. *Prereq: FE341.*

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, univariate times series methods,and the development of econometric models of the economy. Fall 2011-2012. *Prereq: FE312 and (SM219 or SM230).*

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. Fall 2011-2012. *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. Fall. *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. Fall 2011-2012. *Prereq: FE341, Calculus II, and (FE331 or SM339).*

FE450 Game Theory (3-0-3). Game theory is the study of strategic behavior in situations 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. This course counts as a 400-level elective for economics majors (FEC) and as an economics major elective for the quantitative economics major (SQE). Fall 2011-2012. *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. Spring. *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 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 400-level elective for economics majors (FEC) and as an economics major elective for the quantitative economics major (SQE). Spring. *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. Fall 2011-2012. *Prereq: FE341 or FE341Q.*

FE475 Research Seminar in Economics (3-0-3). The Research Seminar in Economics is an introduction to the practical work done by professional economists. Each student applies his/her knowledge of economic theory and quantitative methods to formulate a hypothesis in economic terms, investigate previous research in the specific topice, statistically test its validity, and interpret the policy implications of the results. As the final course in the economics major sequence, the Research Seminar helps to integrate material from several courses, introduces students to the sources of the relevant economics literature, provides practice in reading and critically evaluating quantitative research results, develops competence in use of the computer, and provides a forum for presenting and evaluating the results of student projects. Spring. *Prereq: FEC major or permission of department chair.*

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. Fall 2011-2012. *Prereq: I/C FECH major.*

FE506 Honors Research Project (1-6-4). Directed independent research on topics chosen in FE500. Emphasis on empirical work using microcomputers. Spring. *Prereq: I/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. 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, interpretation and communication skills, independent thinking, and cultural knowledge through the study of literature. These qualities form the basis of study in all our English courses.

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: EA400 or EN400 or EN401, EM300, EE301, EE302, ES300, ES360, and a free elective;
Major: HE217, HE218, HE333, and seven major electives.

English Courses

HE044 Practical Writing Laboratory (0-2-1). This course provides intensive, focused instruction in writing grammatically correct and rhetorically effective prose. Fall 2011-2012. *Prereq: Recommendation of ADAA; Coreq: HE344.*

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. Fall 2011-2012. *Prereq: Placement by the department 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. Fall 2011-2012. *Prereq: None.*

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

HE217 Early Western Literature (3-0-3). A balanced survey of the Western literary tradition and its backgrounds, from the ancient Greece through the Middle Ages. Readings may include classical Greek and Roman epic, drama, and philosophy; selections from the Bible; and medieval poetry, drama and philosophy. Fall 2011-2012. *Prereq: None.*

HE218 Anglo-American Literature (3-0-3). A balanced survey of British and American literary history from the Renaissance thru 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. Fall 2011-2012. *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. Spring. *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. Fall. *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. Spring, Summer. *Prereq: None.*

HE260 Literature of War (3-0-3). A multigenre 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, and military culture. Fall 2011-2012. *Prereq: None.*

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

HE302 Forms of Poetry (3-0-3). A study in the analysis of poetic form and expression. Summer 2011-2012, Fall 2011-2012. *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. Fall 2011-2012. *Prereq: HE111 and HE112.*

HE307 Topics in Film and Literature (3-0-3). A study of American, European, and world film in conjunction with relevant literary works. Summer 2011-2012. *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. Fall 2011-2012. *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. Spring. *Prereq: HE111 and HE112.*

HE315 Restoration and Eighteenth-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. Fall 2011-2012. *Prereq: HE111 and HE112.*

HE317 The Romantic Period (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. Spring. *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. Spring. *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 Brontes, George Eliot, Hardy, Tennyson, the Brownings, Arnold, Carlyle, and Darwin. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Spring. *Prereq: HE111 and HE112.*

HE333 Shakespeare (3-0-3). A study of a representative sample of Shakespeare's tragedies, histories, and comedies. Readings may also include works by Shakespeare's contemporaries. Fall 2011-2012. *Prereq: HE111 and HE112.*

HE340 African-American Literature (3-0-3). A survey of representative African-American literature from such figures as Wheatley, Toomer, Hughes, Hurston, Wright, Ellison, Baldwin, Baraka, Brooks, Hayden, Wilson, and Morrison. Fall 2011-2012. *Prereq: HE111 and HE112.*

HE343 Creative Writing (3-0-3). An introduction to the writing of prose, poetry, and drama. Fall 2011-2012. *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. Summer 2011-2012, Fall 2011-2012. *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. Fall. *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. Fall 2011-2012. *Prereq: HE111 and HE112.*

HE442 Literary Theory (3-0-3). A survey of key problems, figures, and texts in the history of literary and cultural thought. Required of all honors English majors. Fall 2011-2012. *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. Fall, Spring. *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, the concept of the hero. Fall, Spring. *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, Morrison. Fall 2011-2012. *Prereq: one 300-level English course and permission of the department chair.*

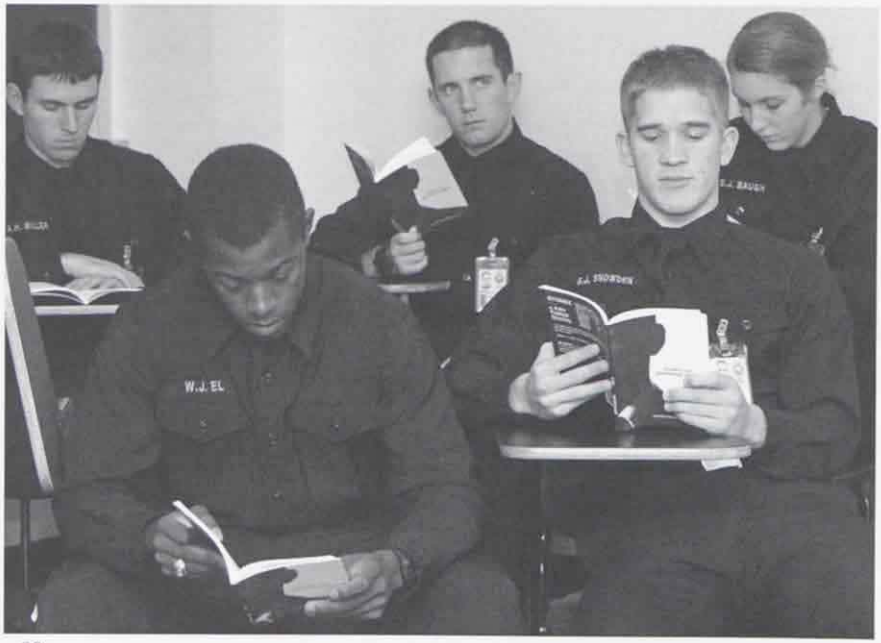
HE467 Studies in a Literary Genre (3-0-3). Study in a special genre. For example, the epic, the autobiographical novel, science fiction, imagist poetry. Fall 2011-2012. *Prereq: one 300-level English course and permission of the department chair.*

HE503 Seminar in Arts & Literature (3-0-3). An interdisciplinary honors seminar concerning a special topic in literature and the arts. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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 onclusions 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, HH215 and HH216), 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: EA400 or EN400 or EN401, EM300, EE301, EE302, ES300, ES360;
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 and Marine Corps 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. Fall 2011-2012. *Prereq: None.*

HH215 The West in the Premodern World (3-0-3). This course analyzes the historical evolution of ethical thought and its impact upon European society and culture from Antiquity to the Enlightenment in a 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, cultivates the development of critical thinking about human beings and their societies, and deepens understanding of the competing values, institutions, and challenges of the modern West. The course fulfills the graduation requirement listed on matrices as HH2XY. Summer 2011-2012, Fall 2011-2012. *Prereq: None.*

HH215A Asia In The Premodern World (3-0-3). This course is designed to provide an alternative to HH215 The West in the Pre-Modern World. 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. Students will study ancient Asian societies, cultures, and ethical thought in comparison with other world traditions including Classical, Judeo-Christian and Islamic cultures. The course fulfills the graduation requirement listed on matrices as HH2XY. Fall 2011-2012. *Prereq: None.*

HH215M The Middle East in the Premodern World (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. Fall 2011-2012. *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. Summer 2011-2012, Fall 2011-2012. *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. Fall, Spring. *Prereq: 3/C HHS major; Coreq: HH215 or HH215A.*

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. Fall 2011-2012. *Prereq: None; Coreq: HH215 or HH215A.*

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. Spring. *Prereq: None; Coreq: HH215 or HH215A.*

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. Spring. *Prereq: None; Coreq: HH215 or HH215A.*

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. Fall. *Prereq: None; Coreq: HH215 or HH215A.*

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. Fall. *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. Fall 2011-2012. *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. Fall. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall. *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. Fall. *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. Spring. *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. Fall 2011-2012. *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. Fall. *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. Spring. *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. Spring. *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. Fall. *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. Fall. *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. Spring. *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. Spring. *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. Spring. *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. Fall. *Prereq: None; Coreq: HH216.*

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. Fall 2011-2012. *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. Spring. *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. Fall. *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 chruch-state relations through the Independence Era. Fall. *Prereq: None; Coreq: HH215 or HH215A.*

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. Spring. *Prereq: None; Coreq: HH215 or HH215A.*

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. Fall, Spring. *Prereq: None; Coreq: HH216.*

HH371 History of Film 1895-1968 (2-2-3). This course examines the history of film from the first showing of motion pictures projected on a screen by the Lumieres in France in 1895. It will consider the origins and development of the film industry in the United States and abroad, the development of film techniques, the growth of the studio and star system, the introduction of sound, and efforts to deal with the rise of television. It will consider films both as an entertainment product for an international market and a source of national expression. Issues of censorship and control will, therefore, be a part of the course. (The arbitrary end date of 1968 is the introduction of the present film rating system in the United States.) Fall 2011-2012. *Prereq: None.*

HH372 The Golden Age of Piracy (3-0-3). The Golden Age of Piracy explores the figure of the pirate from the sixteenth century to today. Students learn about the differences between the "mythical pirate" familiar to today's public and the "historical" pirate of the early-modern era, and determine how and why this "real" pirate has become distorted over time. Students also learn about contemporary piracy and the role of the U.S. Navy in dealing with this growing problem. Students augment their knowledge of historiography and social

scientific theory; work with early-modern primary source materials; engage in case-studies in asymmetric, irregular, and unconventional warfare; study the evolution of privateering and naval warfare; and refine their analytical skills. Fall 2011-2012. *Prereq: None.*

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 subjected to detailed analyses. Examples of topics include piracy, the development of national identities and the growth of capitalism. Fall, Spring. *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. Spring. *Prereq: HH104 and FP130.*

HH380 History of Science (3-0-3). History of Science provides a survey of the history of science from the early Greek natural philosophers through the advent of 20th century "big science", with emphasis on early modern science, including the 17th century scientific revolution, 18th century Enlightenment science, and the post-Enlightenment rise of the modern physical and natural sciences. Spring. *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 Ages (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. Fall 2011-2012. *Prereq: None; Coreq: HH215 or HH215A.*

HH382 Warfare in the Age of Sail, 1500-1815 (3-0-3). This course examines the theory, practice, and nature of warfare on sea and land, both in Europe and European colonies, from about 1500 through the era of Napoleon. Tactical, logistical, technological, and professional developments of Western navies and armies are studied in their political, economic, social, and cultural contexts. The course particularly explores the fundamental questions: What role did Western weapons and warfare, particularly warfare at sea, play in the development of Europe's various empires and Europe's eventual global dominance? Important topics include the rise of gunpowder weapons, the "Military Revolution," the rise of national armies and navies, maritime empires, and the lives of sailors and soldiers. Fall. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *Prereq: None; Coreq: HH216.*

HH386 Topics in Naval/Military History (3-0-3). An open topics history course. Topics vary semester by 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. Spring. *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. Fall, Spring. *Prereq: 1/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. Fall. *Prereq: Admission to the Honors Program in history.*

HH508 Honors Colloquium (3-2-4). Students will propose, conceptualize, and refine their 1/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 precis specifiying both the topic of their Honors research projects and the arguments these projects will advance. Spring. *Prereq: HH507.*

HH509 Honor Senior Thesis (3-2-4). With the guidance of a faculty adviser, 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. Fall 2011-2012. *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. Spring. *Prereq: HHSH major.*

Language and Cultures Department

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 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.

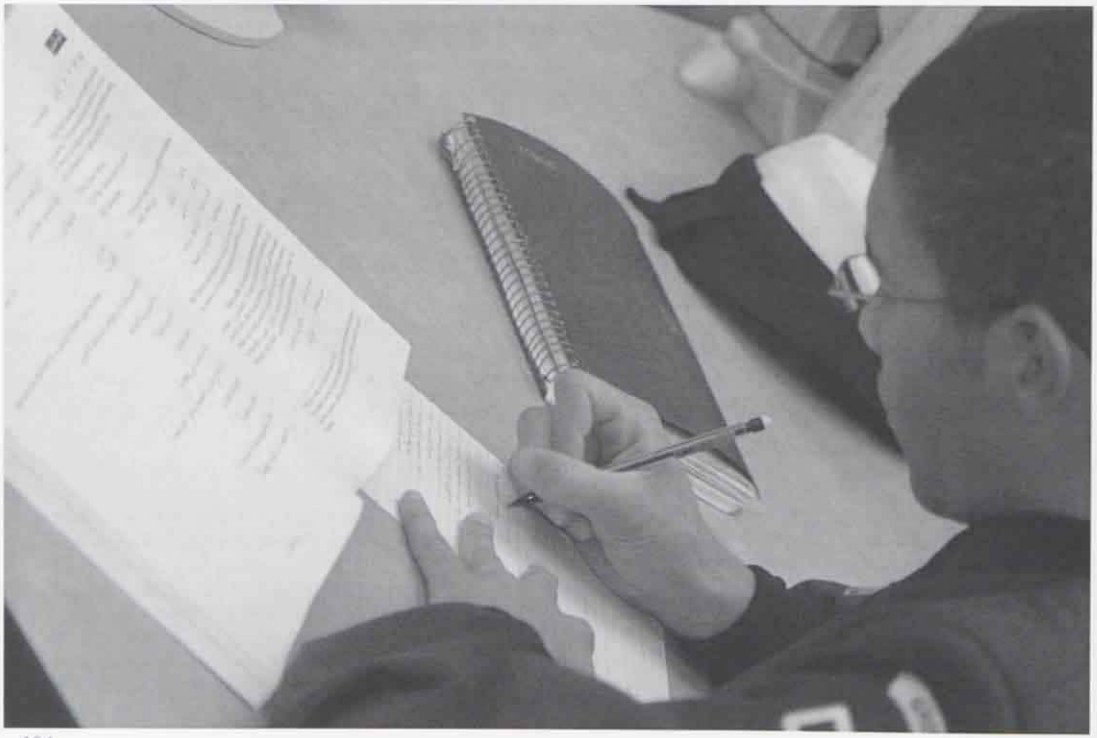
Language and Cultures Department

Arabic Major

The major in Arabic allows students to achieve an intermediate to advanced level of language proficiency in Modern Standard Arabic, the common tongue of twenty-three Arab world countries, 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 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. They have gained an awareness of the multiple ways in which the spoken forms of dialect Arabic vary from standard Arabic, and the important political and cultural implications of language policy in the Arabic world. Finally, they acquire a growing appreciation of the achievements of Arabic cultural history and its contributions to modern global civilization, as well as 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, EA400 or EN400 or EN401;
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.

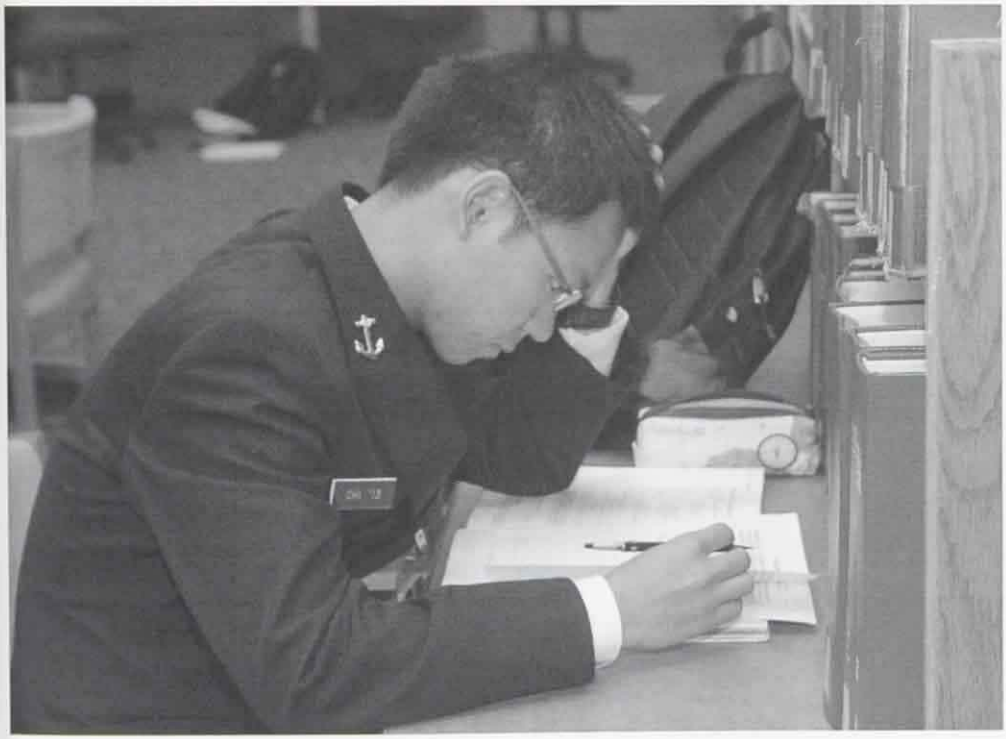


Chinese Major

The major in Chinese provides the opportunity for midshipmen to develop proficiency in the most widely spoken language on earth, Mandarin Chinese. Midshipmen 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. 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 long sentences or short paragraphs, with thorough comprehension, on topics of daily life and everyday Chinese culture. They are also able 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 of routine daily discourse with acceptable fluency and accuracy. Additionally, they understand the fundamental concepts and structures that distinguish Chinese from English or other languages, and the relationship between language structures and aspects of culture. The collateral courses will enable them to present 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, EA400 or EN400 or EN401;
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.



Language Studies Courses

FA101 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. Summer 2011-2012, Fall 2011-2012. *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 the 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. Spring. *Prereq: FA101.*

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. Fall 2011-2012. *Prereq: FA102.*

FA202 Intermediate Arabic II (3-0-3). In this continuation of intermediate Arabic, students suplement 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 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. Spring. *Prereq: FA201.*

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. Fall 2011-2012. *Prereq: Validation of FA202 or a grade of B or higher in FA202 or approval of department chair.*

FA302 Advanced Arabic II (3-0-3). Using exclusively Arabic in the classroom, the students will work toward greater fluency in spoken and written Arabic. The course will include the reading and discussion of a short novel or a 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 various forms of popular media, including Arabic newspapers and magazines, television news, internet sites, and radio broadcasts. Students write a series of short essays on topical societal issues using the vocabulary and syntactical structures practiced in class. Fall 2011-2012. *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. Possible dialects: Syrian (FA342S), Egyptian (FA342G), Palestinian (FA342P), or others as set by the Arabic faculty. Can be repeated for a different dialect. Spring. *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 indentities, intellectual contributions of Arabs, and Arab voices on key issues today. Counts as an upper level Humanities-Social Science course. Fall 2011-2012. *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. Fall. *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. Spring. *Prereq: FA301 and FA302, or approval of department chair.*

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. Fall 2011-2012. *Prereq: None.*

FC102 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 in Division I and II majors. Spring. *Prereq: FC101.*

FC201 Intermediate Chinese I (3-0-3). This course continue from the two Basic Chinese courses and provide further training of the learners' all-round ability to understand, speak, read and write Standard Mandarin. While emphasis is still placed on communicative skills, the learners 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. Fall 2011-2012. *Prereq: FC102.*

FC202 Intermediate Chinese II (3-0-3). A continuation of Intermediate Chinese I. Spring. *Prereq: FC201.*

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. Fall 2011-2012. *Prereq: FC202.*

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

FC350 Chinese Culture through Film (3-0-3). This course, taught in English, offers an introduction to Chinese society and culture through feature films, documentaries, and readings. Each film is studied from various theoretical and analytical perspectives. Topics include Chinese historical events, aspects of Chinese culture and society, relationship between tradition and modernity, gender politics, and Chinese nationalism in the era of globalization. The course is one of Hum/SS electives and part of the Regional Studies courses at USNA. Knowledge of Chinese language is not required. Films have English subtitles. Fall 2011-2012. *Prereq: HE111 or equivalent.*

FC360 20th-Century Chinese Literature (3-0-3). This course, taught in English, offers a study of modern Chinese identity through literature. The course materials include short stories, plays, poems, and novels by Chinese writers, as well as historical narratives, biographies, and literary criticism by Western scholars. The objectives of the course are to understand history, society and culture of 20th-century China; to learn different critical methods and strategies for analyzing and finding value in literary texts; to understand the concept of the self in traditional and modern Chinese thought, and the relationship between the individual self and Chinese national identity. The course is one of Hum/SS electives. Knowledge of Chinese is not required. Spring. *Prereq: HE112 or equivalent.*

FC401 Chinese Language & 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. Fall 2011-2012. *Prereq: FC302 or equivalent.*

FC402 Chinese Language & 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. Spring. *Prereq: FC401 or equivalent.*

FC403 Chinese Language & Culture III (3-0-3). FC403 continues from FC402 to further increase midshipmen's exposure to Chinese vocabulary, grammar, and discourse structure. The course further develops midshipmen's speaking and character recognition skills, as well as knowledge of Chinese culture. Through a rich variety of topics including the origin and structure of Chinese characters, pragmatics, language policies, national identity, and women and marriage, midshipmen gradually move to a more advanced level both in their ability to use Chinese and in their readiness to deal with various cross-linguistic and cross-cultural tasks. Fall 2011-2012. *Prereq: FC402 or equivalent level by validation.*

FC404 Chinese Language & Culture IV (3-0-3). FC404 continues from FC403 to further develop midshipmen's ability in listening, speaking, reading, and writing, and their understanding of Chinese culture. Through a rich variety of topics such as education, population policy, human rights, religion and popular culture, midshipmen gradually move to a more advanced level both in their ability to use the target language and in their readiness to deal with various cross-linguistic and cross-cultural communication tasks. Fall 2011-2012. *Prereq: FC403 or equivalent level by validation.*

FC411 Advanced Reading & Writing I (3-0-3). FC411 focuses on transition from oral communication about daily routines to reading and writing formal Chinese with sophisticated content and complex sentence structure. Midshipmen learn advanced vocabulary and strategies for more challenging material and engage in regular classroom discussion and composition writing in Chinese based on their reading assignments to enhance their reading and writing skills. Fall. *Prereq: FC404 or equivalent level by validation.*

FC412 Advanced Reading & Writing II (3-0-3). FC412 continues from FC411 with the same focus on advanced reading and writing in formal Chinese. The course further enhances midshipmen's ability to process formal written materials with complex structure and more sophisticated ideas. Through reading and writing assignments, the course also prepares midshipmen for communicative tasks in various socio-cultural settings, with an emphasis on both linguistic and stylistic characteristics of formal Chinese. Spring. *Prereq: FC411 or equivalent level by validation.*

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. Fall 2011-2012. *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. Spring. *Prereq: FC401 or FC450 or equivalent.*

FF101 Basic French I (3-0-3). Develops basic communicative skills, with an emphasis on speaking and listening comprehension. Fall 2011-2012. *Prereq: None.*

FF102 Basic French II (3-0-3). Develops basic communicative skills, with an emphasis on speaking and listening comprehension. Spring. *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. Fall 2011-2012. *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. Spring. *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 Francophone Literatures and Cultures. Taught in French. Fall 2011-2012. *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 Literatures and Cultures. Taught in French. Spring. *Prereq: FF202.*

FF411 Development of French Civilization (3-0-3). From the origins to World War II. Fall 2011-2012. *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. Spring. *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. Fall. *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. Spring. *Prereq: FF302 or approval of department chair.*

FF432 France and the Arab World (3-0-3). France and the Arab World engages midshipmen in reading, writing, and discussion about France's ties to the Arab world, including colonization and post-colonial political and cultural connections to North Africa and the Middle East. Topics include French immigration policy and North African communities within France, Francophone literature of the Arab world, and the role of spoken and written French in North Africa and Lebanon. Materials include the articles from the Francophone press, fictional narratives, first person memoirs, documentaries, and feature films. Guest speakers in the classroom offer additional insider views and first hand experience of Francophone Arab countries. Conducted entirely in French. Fall 2011-2012. *Prereq: FF302 or approval of department chair.*

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 on communication strategies. Course materials include computer software, video segments (an ongoing story) and authentic film clips. Fall 2011-2012. *Prereq: None.*

FG102 Basic German II (3-0-3). Emphasizes the spoken language. Spring. *Prereq: FG101.*

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 multimedia, on-line, and print materials. Classroom activities emphasize the personalized creative use of German in arange of student-centered situations and contexts, including role-playing, debates, and oral reports on cultural topics and current events. Fall 2011-2012. *Prereq: FG102.*

FG202 Intermediate German II (3-0-3). Continues development of oral, reading and writing skills. Includes area and cultural topics. Spring. *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. Fall 2011-2012. *Prereq: FG202.*

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

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

FG412 Modern Germany (3-0-3). Reviews main currents of postwar German political history, culture and society. Spring. *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. Fall 2011-2012. *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. Spring. *Prereq: FG320 or approval of department chair.*

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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Spring. *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.*

FJ425 Media Studies in Japanese (3-0-3). The course teaches advanced reading and writing techniques by analyzing newspaper articles, periodicals, TV news and documentaries. The lectures include useful translation strategies and techniques. Fall 2011-2012. S*Prereq: FJ202.*

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. Spring. *Prereq: HE112.*

FL301 Intercultural Communication (3-0-3). This course explores how different cultures filter and communicate experience through their unique views. As military professionals encoun-

ter problems in contact with foreign cultures, communicating effectively with people of different cultural and ethnic backgrounds has become a professional asset. The goal of this course is to increase cultural awareness and competency and to teach communication skills useful for meaningful interaction with foreign cultures. Students will improve communication skills needed today to participate effectively in the growing global community as well as cultural diversity of American society. Fall 2011-2012. *Prereq: HE111.*

FL302 Introduction to Cultural Anthropology (3-0-3). Introduction to Cultural Anthropology for Military Application introduces midshipmen to the concept of culture from an anthropological perspective for practical applications in military operational environments. It is designed to meet the needs of midshipmen by developing their awareness of and sensitivity to the complexity of culturally motivated behavior. Spring. *Prereq: HE111.*

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. Fall 2011-2012. *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 in Division I and II majors. Spring. *Prereq: FR101.*

FR201 Intermediate Russian I (3-0-3). Continues development of oral, reading and writing skills with the emphasison spoken Russian. Includes area and cultural topics. Fall 2011-2012. *Prereq: FR102.*

FR202 Intermediate Russian II (3-0-3). Continues development of oral, reading and writing skills with the emphasison spoken Russian. Includes area and cultural topics. Spring. *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. Fall 2011-2012. *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. Spring. *Prereq: FR202.*

FR350 Russian Literature & 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. Fall. *Prereq: None.*

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

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. Fall 2011-2012. *Prereq: One year of senior high school Spanish or approval 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. Spring. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Spring. *Prereq: FS304 or approval of department chair.*

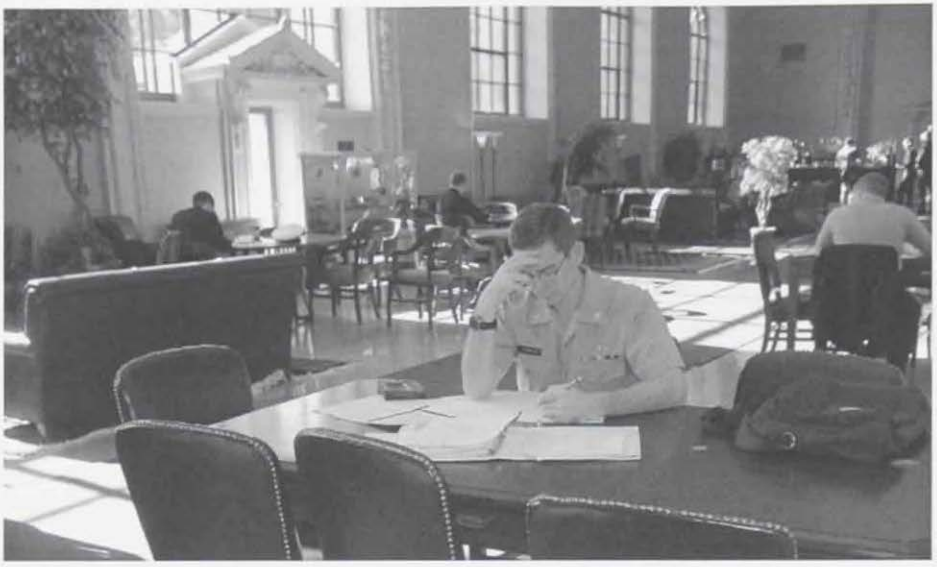
FS413 Spanish Civilization (3-0-3). Culture and civilization of Spain from the Roman period through the 20th century supplemented by videos, readings and classroom discussion. Fall 2011-2012. *Prereq: FS304 or approval of department chair.*

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. Fall 2011-2012. *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. Spring. *Prereq: FS304 or approval of department chair.*

FX101 English for Non-Native Speakers I (3-0-3). Alternative to common plebe year courses HE111. Emphasizes writin+g, American culture and values. Fall 2011-2012. *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. Spring. *Prereq: FX101.*



Political Science Department

Political Science Major

The Political Science major provides prospective naval officers with theories and approaches to understanding domestic and international politics. This wide-ranging, interdisciplinary program develops analytical skills through required introductory courses and advanced electives. The mandatory foundation sequence includes courses in United States Government, International Relations, Political Science Research Methods and a Capstone Research Seminar. Midshipmen select from three concentrations: International Relations and National Security, Comparative Politics or American Government and Law.

Upper level courses explore law, political theory, political institutions, policy analysis, foreign policy and international security as well as key regions – Europe and Russia, Latin America, the Middle East and Asia. The major is enhanced with courses in foreign languages and electives in history and economics. Summer internship programs in Washington D.C. 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 students from more than 140 colleges and universities in the U.S. and abroad. Students hear the ideas of elected officials, policy makers, senior diplomats, military leaders and journalists. Along with NAFAC, the Department sponsors Model United Nations Club and the USNA Debate Team.

The 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, HH215A or HH215M; HH216 and two electives outside the major including one at the 300/400 level;
Language: Four semesters of a foreign language;
Engineering: EA400 or EN400 or EN401, EM300; EE301, EE302, ES300, ES360;
Free elective;
Major: FP210 or FP230, FP220, FP471, and seven major electives.

Political Science Courses

FP130 U.S. 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. Fall 2011-2012. *Prereq: None.*

FP130X U.S. 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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall. *Prereq: FP130.*

FP320 Advanced Political Science Methods (3-0-3). Advanced methods for the analysis of quantitative data in political science. Topics include models for binary, count, and ordinal outcomes. Methods are illustrated with published examples from all fields of political science, including studies of conflict, voter behavior, and public opinion. Prepares students to use appropriate methods for empirical research in Honors and Capstone classes. Spring. *Prereq: FP220 or approval of department chair.*

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. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Spring. *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. Fall 2011-2012. *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. Spring. *Prereq: FP130.*

FP335 Non-Democratic Politics (3-0-3). Examination of modern totalitarian and authoritarian regimes as distinct forms of political organization. Spring. *Prereq: FP130.*

FP340 Modern Political Thought and Ideology (3-0-3). Introduces students to the components of contemporary political ideas and principles. Course distinguishes among philosophical arguments and social movements and emphasizes how distinction blurred during 20th century. Key concerns include social justice, equality, liberty and rights. Readings range from extremes of anarchism to debates about feminism and environmentalism. Fall. *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. Fall 2011-2012. *Prereq: FP130.*

FP345 Environmental Politics and Security (3-0-3). Examines major environmental problems currently influencing U.S. domestic and security policies. Explores major theories and public policy controversies related to global warming, pollution, land, air, water degradation and scarcity, and biodiversity. Discusses enduring and novel ethical issues. Special emphasis placed on DoD environmental programs. Spring. *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. Fall. *Prereq: FP130, 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. Fall 2011-2012. *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 includes 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. Fall, Spring. *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. Fall. *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. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: FP130 and FP210 (or permission of department chair).*

FP365 African Comparative 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. Fall 2011-2012. *Prereq: FP130.*

FP366 African International Relations (3-0-3). This course presents a survey of key actors and relationships in African International Relations and emerging security issues. *Prereq: None.*

FP367 Politics of Russia and the CIS (3-0-3). The development and disintegration of the contemporary Russian political system. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Spring. *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. Fall. 2011-2012. *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. Fall. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall. *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. Fall 2011-2012. *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. Fall, Spring. *Prereq: FP130, FP210.*

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. Fall 2011-2012. *Prereq: FP130, FP210.*

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. Fall 2011-2012. *Prereq: FP130 and FP210.*

FP440 Politics of Central Europe (3-0-3). Analysis of the politics of Eastern Europe from a comparative prospective; the struggle for national identity and economic development in the post-communist environment. Fall. *Prereq: FP130.*

FP450 International Political Economy (3-0-3). This course examines the histrical 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 latter half of the 20th century. Fall 2011-2012. *Prereq: FP210 or instructor permission.*

FP468 Palestinian-Israeli Conflict (3-0-3). The conflict between Arabs and Jews over Palestine is one of the most important factors shaping Middle East politics. The impact of this conflict affects local Arabs and Jews, regional actors and global partners. To date, the Palestinian-Israeli conflict has produced a series of wars and recurring patterns of violence. This course identifies key actors and motivations in the conflict as well as the conflict's intractability. Peace processes are also a topic of discussion. Spring. *Prereq: FP369 or approval of department chair.*

FP471 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. Fall, Spring. *Prereq: 1/C FPS majors only.*

FP480 IT Research Seminar (FP) (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. Spring. *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. Fall 2011-2012. *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

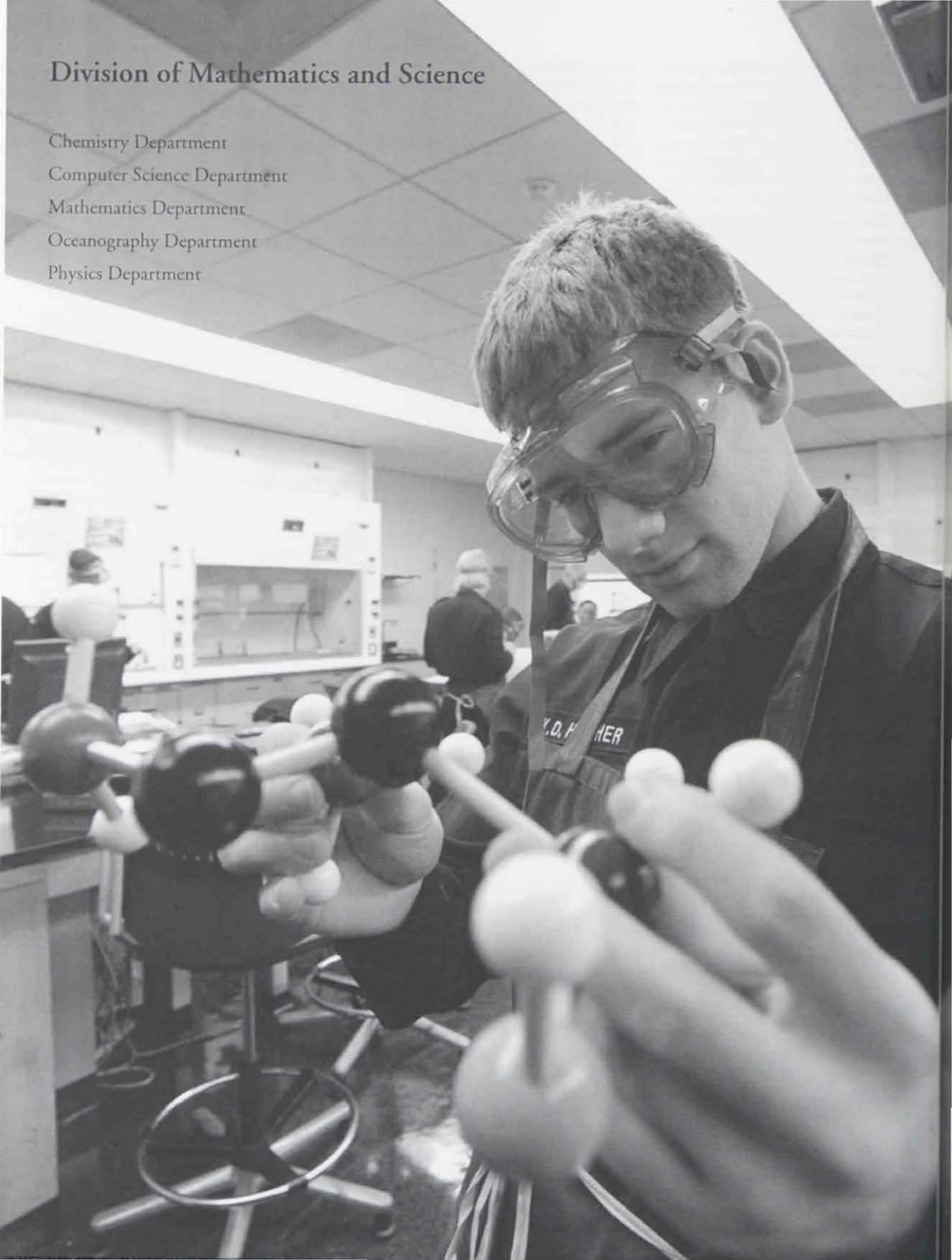
Chemistry Department

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: SC216, SC225, SC226, SC262, SC263, SC335, SC345, SC361, SC356, SC346, SC364, SC476 or SC496, two major electives, SC472, and one free elective.

Chemistry and 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 will include biomechanics, human performance, diet and nutrition, hormones, genetics and the human genome, genetic engineering, DNA "fingerprinting," disease, resistance and immunity. Note: Students cannot get credit for both SB201 and SB211 or SB201 and SB251. Spring. *Prereq: None.*

SB211 Biology for Naval Officer with Laboratory (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 will include biomechanics, human performance, diet and nutrition, hormones, genetics and the human genome, genetic engineering, DNA "fingerprinting," 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. Spring. *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. Summer 2011-2012, Fall 2011-2012. *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. Fall 2011-2012. *Prereq: SB251.*

SB338 Molecular & 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. Spring. *Prereq: SB251 or SC335.*

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. Fall. *Prereq: SB251 and SC335.*

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. Fall 2011-2012. *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. Summer 2011-2012. *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. Fall 2011-2012. *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. Spring. *Prereq: SC225.*

SC216 Analytical Chemistry (3-0-3). 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. Spring. *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. Fall. *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. Fall 2011-2012. *Prereq: SC112 or SC151; Coreq: SC261.*

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. Spring. *Prereq: SC225 and SC261; Coreq: SC262 or SC264.*

SC261 Integrated Lab 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 chromatography, high-performance liquid chromatography, extraction, and sublimation. Identification of chemical substances based on infrared and nuclear magnetic resonance spectroscopy are introduced. Fall 2011-2012. *Prereq: SC112 or SC151; Coreq: SC225.*

SC262 Integrated Laboratory II (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 SC261; Coreq: SC226.*

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 tropospheric ozone and aerosol formation. The impact these process have on current and future naval operations will be discussed. Spring. *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. Fall. *Prereq: SC226.*

SC335 Biochemistry (3-0-3). The chemical basis of life will be examined by studying the relationship between the structure and the 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. Fall 2011-2012. *Prereq: SC226.*

SC336 Biochemistry II (3-0-3). This course will expand and build on topics from SC335, such as biomolecular structure, bioenergetcs 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. Spring. *Prereq: SC335.*

SC338 Molecular & 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. Spring. *Prereq: SB251 or SC335.*

SC341 Chemical Engineering Processes (3-0-3). An introductory course designed to prepare students to analyze material and energy balances relative to chemical processes utilizing the engineering approach for problem-solving. Fall. *Prereq: SC112, SP212, SM221.*

SC345 Physical Chemistry I (3-0-3). This course explores physical and chemical phenomena with an emphasis on thermodynamics. An introduction to kinetics is included. Fall 2011-2012. *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. Spring. *Prereq: SC345.*

SC351 Chemical Structure by X-Rays (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. Spring. *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. Spring. *Prereq: SC226 and SC345.*

SC361 Integrated Lab III–Physical Principles and Quantitative Analysis (1-6-3). Integrated Lab III examines the theory and behavior of molecules and ions in solution. These are studied in the laboratory by classical and modern instrumental methods of analysis. Quantitative laboratory technique is stressed and sampling techniques and statistical analysis of data are introduced. Experimental design and application of analytical methods to real systems is emphasized. Students apply these techniques in a laboratory analysis of their own design. Fall 2011-2012. *Prereq: SC262; Coreq: SC345 unless waived by department chair.*

SC363 Integrated Lab 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 methods and statistical analysis of data are introduced. Students apply these techniques in a laboratory analysis of their own design. To be discontinued after the Class of 2012. Fall. *Prereq: SC264; Coreq: SC345 unless waived by department chair.*

SC364 Integrated Lab IV–Advanced Lab and Seminar (1-6-3). This laboratory course emphasizes the theory, structure, systhesis 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, student and distinguished visitors provides exposure to the wide-ranging scope of chemistry. Spring. *Prereq: SC3631 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 geo-chemical cycles, the effect of military activities on the environment and the use of "green chemistry" in industry. Spring. *Prereq: SC262 or SC264 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. Spring. *Prereq: SC361.*

SC421 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. Spring. *Prereq: SC226 and SC264.*

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 Fall. *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. Fall. *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. Spring. *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. Spring. *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. Spring. *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. Fall. *Prereq: SC335 and SC356 or permission of the 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. Spring. *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 ot the semester. Fall, Spring. *Prereq: 1/C SCH major.*

Computer Science Department

Computer Science Major

The Computer Science major provides a strong foundation in the main areas of the discipline and leads to a Bachelor of Science in Computer Science.

The Academy's nationally recognized computer science program affords 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. It also incorporates courses focused on program performance and efficiency, programming languages, as well as applications in artificial intelligence, graphics, and robotics. The major curriculum lays strong theoretical and practical foundations, and gives midshipmen the flexibility to explore topics that range from the classical to the cutting edge. The computer science program concludes with a capstone project chosen by each midshipman major for further, in depth research.

The computer science major and information technology major are accredited by the Computing Accreditation Commission (CAC) of ABET, Inc. (formerly the Accrediting Board of Engineering and Technology).

The Computer Science Department has several well-equipped, cutting-edge laboratories: three general purpose labs housing small form factor desktop PCs; two labs equipped with dual-boot capability workstations that support both Windows and UNIX operating system environments; and two labs supporting Information Assurance and Networking courses. These latter two are configured with isolated networks that allow midshipmen to explore and experiment with network security. Finally, 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. Departmental graduates in computer science will be well-prepared for the challenges of rapidly evolving computer technologies they can expect to encounter in their Navy and Marine Corps careers.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NE203, NN200, NS300, NL310, NL400, NS42X;
Mathematics: SM223, SM242;
Science: SP211, SP212;
Humanities and social sciences: HH215, HH216 and two electives, including one at the 300/400 level;
Engineering: EE301, EE303, EM300, ES300, ES360, EA/N4XY.
Free elective;
Major: IC210, IC211, IC220, IC221, IC312, IC322, SI340, SI335, SI413, IC470, IC480, and three major electives.

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, EA400 or EN400 or EN401;
Free elective;
Major: IC210, IC211, IC220, IC221, IC312, IC322, IT350, IT360, IT430, IC470, IC480, and three major electives.

Computer Science and 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. Fall 2011-2012. *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 fundaments of Java are presented along with exception handling, I/O, event driven programming, simple GUIs and generics. Summer 2011-2012. *Prereq: IC210 or SI204.*

IC220 Computer Architecture & Organization (3-0-3). This course introduces students to performance metrics, instruction set architectures, assembly language, logic design, memory hierarchies, and pipelining. Spring. *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. Spring. *Prereq: (IC210 or SI204 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. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: (IC221; Coreq: SM242) or permission of department chair.*

IC470 Software Engineering (2-2-3). An introduction to the basic principles of software engineering. Fall 2011-2012. *Prereq: IC312.*

IC480 Research Seminar/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. Fall 2011-2012. *Prereq: IT470 or Chair Permission.*

IT350 Web & Internet Programming (2-2-3). Web site design and management, clients and servers, client and server side scripting languages, web transmission protocols. Fall 2011-2012. *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. Spring. *Prereq: IC312 and IT350.*

IT430 IA 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. Spring. *Prereq: IC322 or IT340.*

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. Fall 2011-2012. *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. Fall. *Prereq: IT350 and IT360.*

IT452 Advanced Web & 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. Fall, Spring. *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. Fall, Spring. *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. Fall 2011-2012. *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. Fall, Spring. *Prereq: (IC322 or IT340) and (IT360 or IT420).*

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 IT majors cannot take this course. Fall. *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 courses will build. Spring. *Prereq: None.*

SI221 Data Structures (2-2-3). Data representation and information management. Dynamic memory, recursion, lists, stacks and queues. Storage structures, allocation and manipulation. Spring. *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. Spring. *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. Fall. *Prereq: None.*

SI333 Algorithms and Functional Languages (4-0-4). 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. Coverage of functional programming paradigm. Spring. *Prereq: SI321.*

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. Spring. *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. Spring. *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. Fall 2011-2012. *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, file systems, multiprogramming, multiprocessing, data security and protection. Fall, Spring. *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. Fall 2011-2012. *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. Fall, Spring. *Prereq: IC312.*

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. Spring. *Prereq: SI334 (SI336 for the Class of 2009 and beyond).*

SI440 Database Systems (3-0-3). Topics include database systems architecture, relational model, normalization and implementation issues. Fall 2011-2012. *Prereq: SI321 (IC312 for the Class of 2009 and beyond).*

SI452 Advanced Computer Architecture (3-0-3). This course provides an advanced study of the design and evaluation of high performance computer systems. Spring. *Prereq: SI232 (IC220 for the Class of 2009 and beyond).*

SI454 Computer Networks (3-0-3). The course presents major topics in the area of computer networks. It views a computer network as a group of related layers or abstract machines as exemplified by the International Standards Organization (ISO) network reference model and Internet Layer Model. The course presents the basic concepts necessary to understand the design and operation of computer communication networks. Fall. *Prereq: SI232, SI321, and SM230C.*

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. Spring. *Prereq: SI454 (IC322 for the Class of 2009 and beyond).*

SI457 Information Assurance (2-2-3). The course provides an introduction to the theoretical and practical facets of Information Assurance including: secure operating systems, public key cryptography, system and network security, and offensive and defensive information warfare operations. Laboratory work will include student exercises demonstrating information assurance concepts. *Prereq: SI411 and SI454.*

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. Fall. *Prereq: SI321 (IC312 for the Class of 2009 and beyond).*

SI4 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. Spring. *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. Spring. *Prereq: SI221 (IC312 for the Class of 2009 and beyond).*

Mathematics Department

Mathematics Major

The mathematics major (*http://www.usna.edu/MathDept*) 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. Two tracks are offered: Applied Mathematics and Mathematics. 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 elective;
Mathematics: SM221, SM222;
Major - Both Tracks: SM261, SM280, SM233, SM291, SM239, SM331;
Free elective.

Applied Mathematics Track: SM365, SM339, applied mathematics 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 additional major electives (at least one at the 400 level).

Mathematics 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 a major elective for Mathematics majors. Fall 2011-2012. *Prereq: SM219, SM239 or SM230.*

SA305 Linear Programming (3-0-3). An introduction to linear programming. Topics include: extensive linear programming modeling techniques, the Simplex method, sensitivity analysis, and basic linear programming theory. Midshipmen cannot receive credit for both SA305 and SA401. Spring. *Prereq: SM261 or permission of department chair.*

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. Fall 2011-2012. *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. Fall, Spring. *Prereq: SM261.*

SA402 Dynamic & 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. Spring. *Prereq: (SM239 or SM230) and SM261.*

SA403 Graph and Network Algorithms (3-0-3). This course introduces graph algorithms for problems in network and combinatorial optimization. Topics include: minimum spanning trees, matchings, shortest paths, maximum flows and minimum cost flows. Students will also be expected to program algorithms on a computer. Spring. *Prereq: SM233 or permission of department chair.*

SA405 Advanced Mathimatical Programming (3-0-3). This course covers a range of advanced topics in mathematical programming. Topics include integer programming modeling, branch-and-bound methods, integer programming theory and nonlinear optimization theory and algorithms. Students will also learn to use a set-based modeling language for an advanced integer programming solver. Topics will vary with instructor. Fall. *Prereq: SA305 or permission of department chair.*

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. Fall 2011-2012. *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. Spring. *Prereq: permission of department chair.*

SA421 Simulation Modeling (3-0-3). Discrete simulation of systems using a simulation language. Includes random variate generation, validation and verification of simulations, input and output data analysis. Semester projects are done as part of an analysis team. Fall. *Prereq: SM233. Coreq: SM339.*

SA430 Logistics (3-0-3). Investigation of techniques of operations analysis applicable to the solution of problems in reliability, maintainability, availability and inventory. Fall. *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. Spring. *Prereq: SM339.*

SA475 Operations Research Capstone (3-0-3). This course is a capstone course for the Operations Research 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. Spring. *Prereq: I/C SMO 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. Spring. *Prereq: I/C SQE major.*

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 Fall 2011-2012. *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. Fall 2011-2012. *Prereq: None.*

SM122 Calculus II (4-0-4). Continuation of Calculus I. Summer 2011-2012, Fall 2011-2012. *Prereq: Calculus I (SM131 or SM121 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 had prior differential calculus experience. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: permission of department chair.*

SM162 Calculus with Computers II (5-0-5). A continuation of SM161. Spring. *Prereq: SM161.*

SM212 Differential Equations (4-0-4). Linear and simultaneous differential equations; solution by Laplace transform; partial differential equations and Fourier series. Summer 2011-2012, Fall 2011-2012. *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. Summer 2011-2012, Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Summer 2011-2012, Fall 2011-2012. *Prereq: Calculus II (SM122 or SM162).*

SM233 Introduction to Applied Mathematics (2-2-3). This course introduces students to several fundamental topics in applied mathematics: simulation and statistical modeling, applications of linear algebra, partial differential equation models, and computational tools and topics. Appropriate computer software will be introduced. Spring. *Prereq: Calculus III; 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. Fall 2011-2012. *Prereq/ Coreq: Calculus III (SM221 or SM223).*

SM242 Discrete Mathematics & 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. Fall 2011-2012. *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. Fall. *Prereq: Calculus II (SM122 or SM162).*

SM261 Matrix Theory (3-0-3). Matrices, transformations, linear equations, vector spaces, characteristic matrix, eigenvalues, orthogonality. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Spring. *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. Fall, Spring. *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 Application to Electrical Engineering (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. Fall 2011-2012. *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. Fall. *Prereq: Differential Equations (SM212 or SM222).*

SM316 Engineering Mathematics with Probability & Statistics (3-0-3). Basic concepts in probability and statistics, arithmetic of complex numbers, and Fourier analysis. Credit cannot be given for both SM239 and SM316. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: SM261 and SM291.*

SM331H Real Analysis I (4-0-4). Honors versions of SM331. Fall 2011-2012. *Prereq: permission of department chair.*

SM332H Real Analysis II (4-0-4). Honors version of SM334. Spring. *Prereq: permission of department chair.*

SM333 Sequences, Series & Functions (4-0-4). This course deals with the convergence properties of sequences and series, including: limit theorems and convergence tests, power series, sequences and series of functions, pointwise and uniform convergence, and the analytic operations preserved by the convergence process. Midshipmen may not receive credit for both SM333 and any of SM331, SM331H, and SM332H. Fall. *Prereq: SM261 and SM291, or permission of department chair.*

SM334 Advanced Calculus (4-0-4). The course investigates the topology of the real numbers, including material on compactness and continuity of functions. Uniform continuity, differentiation and the Riemann integral are all carefully developed. Applications to the Mean-Value Theorem, Taylor's Theorem and L'Hospital's Rule are provided. Midshipmen cannot receive credit for both SM334 and any of SM331, SM331H and SM332H. Spring. *Prereq: SM333 or permission of department chair.*

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. Fall. *Prereq: SM239 and SM261.*

SM342 Discrete Structures (3-0-3). Foundations and methods of proof. Combinatorics, graph theory, group theory. Selected topics. Counts as track elective for the SMA and the SMP majors. Fall, Spring. *Prereq: SM122 or SM162.*

SM361 Intermediate Linear Algebra (4-0-4). This course deals with abstract linear algebra and its applications. Topics include: abstract vector spaces, linear transformations, inner products and norms, orthogonal bases, projections, singular value decomposition and other matrix factorizations, and numerical linear algebra. Applications will be chosen by the instructor, but might include: image compression, principal components analysis, and applications to physics. Fall. *Prereq: (SM233, SM261 and SM291) or permission of department chair.*

SM362 Modern Algebra (3-0-3). Integers, groups, mappings, rings, fields. Fall 2011-2012. *Prereq: SM261 and SM291.*

SM364 Introduction to Scientific Computing (3-0-3). Computer arithmetic and errors; algorithms and programs for: function approximations, numerical integration, and the numerical solution of ordinary differential equations; an introduction to programming. Spring. *Prereq: SM361 or permission of department chair.*

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, numerical integration, and the numerical solution of ordinary differential equations; an introduction to programming. Fall 2011-2012. *Prereq: SM261.*

SM411 Introduction to Complex Variables (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. Fall. *Prereq: SM331.*

SM415 Mathematical Modeleling of the Ocean & Atmoshere (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. Spring. *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. Fall 2011-2012. *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 (SM331 or approval of department chair) and SM365 and (SM233 or experience with MATLAB).*

SM426 Numerical Methods for Differenital 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).*

SM437 Experimental Design (3-0-3). This is an advanced applied statistics course focusing on the collection and analysis of data arising from either sampling finite populations or arising from scientific experiments. Emphasis is placed on simple random sampling, stratified sampling, cluster sampling, ratio estimation, randomized block designs, factorial designs, and confounding. Spring. *Prereq: SM339.*

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. Fall 2011-2012. *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.*

SM450 Topics in Pure & Applied Mathematics 2 (3-0-3). Senior-level topics in pure and applied mathematics. The content will vary in order to keep abreast of new ideas and approaches. Fall 2011-2012. *Prereq: permission of department chair.*

SM461 Linear Algebra (3-0-3). Vector spaces, linear transformations, Jordan canonical form, inner product spaces. Fall 2011-2012. *Prereq: SM261 and SM291 and (SM331/SM331H or permission of department chair).*

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.*

SM465 Advanced Differential Equations (3-0-3). Existence and uniqueness of solutions to ordinary differential equations. Stability, oscillation, dynamical systems. *Prereq: SM331 and either SM212 or SM222.*

SM468 Cryptography, Codes & Information Security (3-0-3). Cryptography, Codes, and Information Security investigates the mathematics of secret and error-correcting codes. Spring. *Prereq: SM261 or permission of department chair.*

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. Spring. *Prereq: I/C SMA Major or permission of department chair.*

SM473 Projects in Mathematics & 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. Spring. *Prereq: I/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 mathematic 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. Spring. *Prereq: I/C SMP Major or permission of department chair.*

General Science Major

The major in general science gives students an opportunity to pursue a broad, scientifically-oriented program in applications of mathematics and science. Course work in the major is drawn from each of the departments in the division. The major permits midshipmen to experience an interdisciplinary 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: HH2XY, HH216 and two electives including one at the 300/400 level;
Engineering: EA400 or EN400 or EN401, EM300, EE301, EE302, ES300, ES360;
Free Elective;
Major: NP340, SA302, SI200, B251, SM212, SO231, SO244, SP301, SP411, two mathematics, science or engineering electives and a free elective.

Quantitative Economics Major

The major in quantitative economics is interdisciplinary, focusing on applications of mathematics to economic problems. Students are provided with a broad set of mathematical tools and a solid background in economic theory. About half the courses are taken in economics and half 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, SM239;
Science: SP211, SP212;
Humanities: HH2XY, HH216 and two electives including one at the 300/400 level;
Engineering: EA400 or EN400 or EN401, EM300, EE301, EE302, ES300, ES360;
Free Elective;
Major: FE210, FE312, FE341, FE445, SM261, SM279, SM339, SA401, SA475E, and five major electives.

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 our nation's largest estuary, the Chesapeake Bay. The academy's oceanographic research vessel enables midshipmen to collect samples and oceanographic data afloat and deliver them to the department's shore labs, and midshipmen have the opportunity to participate in a three-week oceanography cruise aboard this vessel during the summer training period. Classroom laboratories in Chauvenet Hall house the introductory and advanced oceanography and meteorology labs, a biological oceanography lab, and a remote sensing / geographic information systems lab. The advanced meteorology 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, and a color weather radar display, 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;
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. Fall 2011-2012. *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 sea water and ocean currents and water masses. A historical perspective is provided. Laboratory exercises concentrate on Chesapeake Bay parameters as seasons change. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *Prereq: None.*

SO335 Oceanographic & Meteorological Quantitative Method (2-2-3). Oceanographic and Meteorological Quantitative Methods. 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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall, Spring. *Prereq: 2/C or 1/C standing or by permission of the 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. Fall, Spring. *Prereq: 2/C or 1/C standing or by permission of the 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. Fall. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Fall 2011-2012. *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. Fall, Spring. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall 2011-2012. *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*. Fall 2011-2012. *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. Fall 2011-2012. *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. Fall, Spring. *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. Spring. *Prereq: 1/C Oceanography Major.*

SO475 Readings in Oceanography And Meteorology (0-6-3). An independent study course in conjunction with a faculty member to prepare midshipmen to conduct independent research. In this course, the midshipmen will meet with their adviser to discuss topics in scientific literature related to their research project. They will also write a summary report of the scientific literature they have reviewed, which will be integrated in their final research project report in the following semester. Fall 2011-2012. *Prereq: 2/C or 1/C standing and approval of department chair.*

SO476 Readings in Oceanography and Meteorology (0-6-3). An independent study course in conjunction with a faculty member to prepare midshipmen to conduct independent research. In this course, the midshipmen will meet with their adviser to discuss topics in scientific literature related to their research project. They will also write a summary report of the scientific literature they have reviewed, which will be integrated in their final research project report in the following semester. Spring. *Prereq: 2/C or 1/C standing and approval of department chair.*

SO503 Honors Research Methods (2-2-3). Honors Research Methods in Oceanography and Meteorology. 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. Spring. *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 presentation to the faculty. Fall 2011-2012. *Prereq: SO503 and SOCH major.*

SO506 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 presentation to the faculty. Spring. *Prereq: SO503 and SOCH major.*

SO513 Honors Oceanic and Atmospheric Processes (3-2-4). Course is an advanced version of SO414 for honors students. Fall. *Prereq: SM311O and SO345H.*

SO516 Honors Waves and Tides (2-2-3). Course is an advanced version of SO416 for honor students. Fall 2011-2012. *Prereq: SO513 and SOCH major.*

Physics Department

Physics Major

The study of physics joins a set of physical laws and definitions with the integrative reasoning essential for modeling and solving real-world problems. The physics major provides a strong foundation for further work in a broad range of technical fields through study of fundamental physical concepts and development of students' experimental techniques. In addition to the traditional physics track, an astrophysics track (SPAA) and an applied physics (SPA) track are available. The astrophysics track focuses on the study of physics in the context of astronomy and cosmology, and includes an introduction to observational techniques. The applied track encompasses applications of physics in the other engineering and science disciplines. The bachelor of science degree is awarded.

The theory of relativity, mechanics, electromagnetism, quantum mechanics, field concepts, and the origin, propagation and reception of waves (of all kinds) are among the topics physics majors master. The goal throughout is developing an open-minded, creative, and analytical approach to the physical world and to problem-solving in general.

Midshipmen majoring in physics have access to eight advanced laboratories. Specialties within the department are: underwater and physical acoustics, astronomy and astrophysics, computational physics, laser optics and photonics, nanoscopic and macroscopic solid state physics, accelerator-based nuclear and particle physics, and theoretical physics.

The physics major is excellent background for virtually all 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.

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 introduce a variety of applications. Topics include mechanics, electricity, magnetism, wave motion, fluids, sound and light. Lectures, recitations, hands-on laboratories, and large-scale demonstration lectures are employed. Fall 2011-2012. *Prereq: Chemistry II (SC112 or SC151); Coreq: Calculus III (SM221 or SM223 or SM251) or approval of department chair.*

SP212 General Physics II (3-2-4). Continuation of SP211. See SP211 description for topics. Summer 2011-2012, Fall 2011-2012. *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. Newtons 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. Fall 2011-2012. *Coreq: 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. Spring. *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. Spring. *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. Fall 2011-2012. *Prereq: SP212 or SP226.*

SP310 Astronomy (3-0-3). The fundamentals of astronomy as a physical science, surveying the Universe from the solar system through stellar, galactic and extragalactic astronomy and cosmology. Fall 2011-2012. *Prereq: SP211 and SP212 or SP221, SP222 and SP226 or approval of director of the astrophysics track.*

SP324 Applied 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. Spring. *Prereq: 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. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Fall, Spring. *Prereq: SP211.*

SP351 Problem Solving Methods I (3-0-3). Problem Solving Methods for Physics I. 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; applied integration, differential equations and Fourier series; linear algebra, introduction to vector spaces; vector calculus; and additional topics chosen from geometry, calculus of variations and special applications in physics. Fall 2011-2012. *Prereq: SM212; Coreq: SP212 or SP222.*

SP352 Problem Solving Methods II (3-0-3). Problem Solving Methods for Physics II. A course in the techniques of mathematics for general physics with special emphasis on applications for electromagnetism and quantum mechanics. The course includes applications of vector calculus, further applications of linear vector spaces, boundary value problems, techniques for quantum mechanics, and additional topics chosen from among introductory numerical methods, fundamentals of statistics and special applications in physics. Spring. *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. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *Prereq: SP324.*

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; pyschoacoustics, architectural acoustics, musical acoustics and Sonar. Fall 2011-2012. *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. Fall 2011-2012. *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. Spring. *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. Spring. *Prereq: SP324.*

SP445 Astrophysics I (3-0-3). A study of the physics of astronomical objects such as stars and galaxies. Fall 2011-2012. *Prereq: SM212 and (SP301 OR SP324) and (SP310 or approval of the 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. Spring. *Prereq: SP445.*

SP447 Observational Astrophysics (2-2-3). This laboratory course is designed to give students hands-on experience with the techniques 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. Fall 2011-2012. *Prereq: SP310.*

Division of Professional Development

- Seamanship and Navigation Department
- Career Information and Officer Accessions Department

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. The Career Information and Officer Accessions Department facilitates each midshipman's transition from USNA to their first experience as Fleet junior officers through the Career Information Program and, ultimately, service assignment.

Seamanship and Navigation Department

The Seamanship and Navigation Department provides midshipmen with the necessary skills that are essential to the future leaders of the Navy and Marine Corps. To support the mission of the Naval Academy, the department's core courses instill the fundamentals of Seamanship, Navigation, and Warfare. This foundation of naval skills is applied through a wide spectrum of courses which culminate in the Junior Officer Practicum Course. Yard Parol Craft Summer Training is provided to further reinforce the core courses.

Career Information and Officer Accessions Department

The Department of Career Information and Officer Accessions serves as the coordination center for midshipmen career development and service assignment.

The Career Information Program (CIP) educates midshipmen about future Navy and Marine Corps career options. It is an integrated four-year plan, comprised of briefings, social events, and discussion of current trends in the operational Navy and Marine Corps with junior officers, as well as daily midshipmen interaction with military staff and faculty.

The culmination of CIP is the service assignment process, by which midshipmen are assigned to their future warfare communities. The process matches a midshipman's qualifications, aptitude, and career preferences with current and projected Navy and Marine Corps officer manning requirements. The department serves as the liaison with the Chief of Naval Personnel to ensure the Naval Academy provides the best-qualified officers ready to lead Sailors and Marines.

Seamanship and Navigation Courses

NN101 Introduction to Navigation (1-2-2). A comprehensive introduction to basic navigation concepts, voyage planning, and contact tracking on maneuvering boards. The course objective is to develop skills in the practical uses of the navigation chart. Midshipmen are introduced to the navigation chart format and associated plotting tools and techniques and learn the concepts of chart coordinates, while measuring and calculating distances, times directions and speeds. Reinforces navigation rules and ship handling skills learned in NS101. Includes at-sea labs on 108 foot Yard Patrol (YP) craft and shore-based bridge simulator labs, providing midshipmen hands-on experience navigating in and out of harbors. Summer 2011-2012. *Prereq: None.*

NN200 Navigation and Piloting (1-2-2). This course builds upon the foundation of navigation and seamanship skills established in NS101 and NN101 and honed while at-sea during 3/C summer training. Reinforces piloting skills through practice on 108 foot Yard Patrol (YP) craft and in shore-based bridge simulator labs, providing midshipmen with hands-on experience navigating in and out of harbors, and introduces them to the principles of radar and electronic navigation, weather for the mariner, tides and currents, and voyage planning. Summer 2011-2012, Fall 2011-2012. *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 foot Yard Patrol (YP) Craft and shore-based bridge simulator labs, providing midshipmen with hands-on experience navigating in and out of harbors where midshipmen gain ship maneuvering experience and practical application of the navigation rules. Fall 2011-2012. *Prereq: None.*

NS300 Naval Warfare (0-2-1). This course examines naval doctrine and the tactical decision making factors that influence warfare planning and operations. The course articulates operational concepts that govern the employment of naval forces by providing midshipmen with examples of tactics, techniques, and procedures. Surface, undersea, air, strike, and expeditionary warfare areas are examined throughout the course. Comprehensive war-gaming exercises provide midshipmen with the opportunity to plan and develop an operation in a tactical situation. Practical application of course material is exercised through the development of the commander's intent, mission analysis, and tactical decision making while planning potential courses of action for an in-depth joint operation. Summer 2011-2012, Fall 2011-2012. *Prereq: 2/C standing or Physics major or department chair approval.*

NS421 Junior Officer Practicum (Surface Warfare) (0-2-1). A course to provide information about the duties and responsibilities required of a junior officer in the surface warfare 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 ship-handling and bridge watch-standing skills through the use of YPs and simulation software. Those entering surface warfare, surface warfare (nuclear), and any other surface warfare option upon graduation should take this course. Spring. *Prereq: 1/C standing.*

NS422 Junior Officer Practicum (Submarine Warfare) (0-2-1). A course to provide information about the duties and responsibilities required of a junior officer in the submarine warfare community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the submarine force. Topics include surfaced and submerged navigation, mission planning, and quality assurance. Those entering the submarine community upon graduation should take this course. Spring. *Prereq: 1/C standing.*

NS423 Junior Officer Practicum (Naval Aviation) (0-2-1). A course to provide information about the duties and responsibilities required of a junior officer in the aviation community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the aviation community; 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. Those entering Navy Pilot, Naval Flight Officer, Intelligence, Cryptology, and Information Warfare communities upon graduation should take this course. Spring. *Prereq: 1/C standing.*

NS424 Junior Officer Practicum (Marine Corps) (0-2-1). A course to provide information about the duties and responsibilities required of a junior officer in the Marine Corps. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the Marine Corps. Instruction includes, 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 is placed on combat and tactical decision-making to develop and enhance the midshipman's critical thinking ability, analytical skills, and bias for action. Additionally, all concepts are reinforced through demanding physical fitness routines designed to challenge the student physically as well as mentally. Those entering the United States Marine Corps, Marine Corps Pilot, Marine Corps Naval Flight Officer, and Navy Civil Engineering Corps communities upon graduation should take this course. Spring. *Prereq: 1/C standing.*

NS425 Junior Officer Practicum (Special Warfare) (0-2-1). A course to provide information about the duties, responsibilities, and challenges facing a junior officer in the Naval Special Warfare (NAVSPECWAR) community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to NAVSPECWAR. 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 to discuss leadership as a junior officer. Those entering the Naval Special Warfare community upon graduation should take this course. Spring. *Prereq: 1/C standing.*

NS426 Junior Officer Practicum (EOD) (0-2-1). A course to provide information about 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 Special Operations community. Practical exercises include dive locker training, underwater training and small boat handling skills in preparation for Dive School. Those entering the Special Operations/Explosive Ordnance Community should take this course. Spring. *Prereq: 1/C standing.*

NS427 Junior Officer Practicum (Restricted Line & Staff Corps) (0-2-1). A course to provide information about the duties and responsibilities required of a junior officer in restricted line and staff corps communities. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the specific communities. Course material is selected to provide advanced study in the fundamentals of the appropriate service communities. Those entering Medical Corps, Supply Corps, and other Staff Corps and Restricted Line communities should take this course. Spring. *Prereq: 1/C standing.*

Division of Leadership Education and Development

Leadership, Ethics and Law Department

Leadership Education and Development (LEAD) Masters Degree Program

Character Education Program

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

Division of Leadership Education and Development

The Division of Leadership, Education and 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 Leadership, Education and 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

The Leadership, Ethics and Law Department in the Division of Leadership, Education and 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, NL311, NL312, NL313, NL335, NL340, NL420, NL425, NL430, NL435, NL440, NL450, NP230, NP232, NP250, NP335, NP336, NP340, NP410 and NP420.

Leadership Education and Development (LEAD) Program for Company Officers

The Division of Leadership, Education and Development coordinates graduate education provided by a host university in the greater Baltimore-Washington, D.C., metropolitan area. The LEAD Program allows talented, highly qualified Navy and Marine Corps Junior Officers to enroll in a one year graduate program at a top tier university prior to serving as a Company Officer at the United States Naval Academy. The program develops students' abilities to think critically and analytically, and focuses on the knowledge, skills, and abilities essential for understanding, designing, and conducting leader and team development as a Company Officer at the Naval Academy and in future assignments in the Fleet. Junior Officers are awarded a Master's of Professional Studies Degree (MPS) by the host institution upon program completion.

Character Education Program

The Character Education Program consists of interactive seminars, speaker series, conferences, and experiential activities that begin during Plebe Summer and continue through all four years at the Naval Academy. The earliest seminars introduce midshipmen to the concepts of professional officership and core values in the military, as well as understanding the importance of followership as a developmental construct of leadership. The Character Education Program also includes speaker series and experiential activities, such as visits to the National Holocaust Museum in Washington, D.C. and summer training opportunities and travel abroad. The Character Education Program culminates with the 1/C year Officership Capstone Seminar, which introduces future Junior Officers to some of the complex leadership and ethical challenges that they are likely to face upon graduation and commissioning. The Character Education Program is integrated with both the academic leadership education and the formal leader training program and is an important aspect of the process of socialization to the military officer identity.

Leadership Ethics And Law

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. Fall 2011-2012. *Prereq: 3/C standing.*

NL110 Preparing to Lead (2-0-2). Principles of Self Leadership and Organizational Dynamics (2-0-2). 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. Fall 2011-2012. *Prereq: 4/C standing.*

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. Counts for Humanities-Social Science credit. Summer 2011-2012, Fall 2011-2012. *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. Counts for Humanities-Social Science credit. Fall 2011-2012. *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. Counts for Humanities-Social Science credit. Fall 2011-2012. *Prereq: NL110.*

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. Counts for upper level Humanities-Social Science credit. *Prereq: NL200.*

NL310 Leadership: Theory and Applications (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. Summer 2011-2012, Fall 2011-2012. *Prereq: 2/C standing.*

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. Counts for upper level Humanities-Social Science credit. *Prereq: 3/C standing or higher.*

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. Counts for upper level Humanities-Social Science credit. Fall 2011-2012. *Prereq: none.*

NL313 The Psychology of Crime (3-0-3). Why do individuals commit crime? 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 psychological and behavioral bases of criminal conduct in mock defendants, to recommend appropriate punishments and treatment, and to assess rehabilitative potential. Counts for upper level Humanities-Social Science credit. Fall. *Prereq: 1/C standing and NL200; Coreq: NL400.*

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. Counts for upper level Humanities-Social Science credit. NL230 recommended.

NL340 Change Management (3-0-3). This course will explore the theories, practices and tools/techniques for managing change in an organizational environment. Applicable theories and strategic approaches to solving organization problems such as human performance technology, organizational development, and "Lean Six Sigma" will be analyzed and compared. The overarching goal of this course is to develop the knowledge, abilities and skills that will assist future Navy and Marine Corps officers to successfully implement change and transformation in a variety of military organizational environments in the Fleet. Counts for upper level Humanities-Social Science credit. Fall 2011-2012. *Prereq: NL310 or permission of department chair.*

NL360 Culture and Leadership (3-0-3). This course will explore the theories and concepts of culture from multiple perspectives in order to provide future military officers with a broad understanding of the role of culture and human terrain in communities, societies and in the armed forces. Students will develop knowledge, abilities and skills that will assist future officers to successfully operate in the context of complex military environments around the globe. The course will follow a pedagogical approach of classroom theory integrated with the case study method of analysis and fieldwork conducted both on the Yard and away from USNA. Counts for upper level Humanities-Social Science credit. Summer 2011-2012. *Prereq: 2/C standing or permission of department chair.*

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. The 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. Summer 2011-2012, Fall 2011-2012. *Prereq: 1/C standing or permission of department chair.*

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.*

NL425 Engineering Leadership (3-0-3). The purpose of this course is to study the concepts and context of leadership in the technical and industrial environment. The course combines lecture, readings about technical leadership, and real-world case studies. Programs such as Apollo, the Joint Strike Fighter, the Vision for Space Exploration, and significant failures of major engineering programs will be analyzed from the technical leadership perspective. This course will illustrate how management of such complex technological programs requires the melding of technical expertise, organizational theory, and leadership. The subject matter has relevance for military leaders as they are increasingly being called upon to lead and manage in technical and industrial environments. Counts for upper level humanities-social science credit. Fall, Spring. *Prereq: NL310 or permission of department chair.*

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. Counts for upper level Humanities-Social Science credit. *Prereq: none.*

NL435 Peace War and Social Conflict (3-0-3). This upper division course examines the social and military aspects of war and peace. Using sociological theories, concepts and methods the course considers, at the macro level of analysis, war and combat as social conflict (origins and causes, events and processes, effects and outcomes). At the meso-level of analysis, the course addresses the dynamic effects of social structure in the processes of war, combat and peace. While the Modern Western experience occupies a considerable section of the course, non-Western analyses of war and peace, as well as other forms of social conflict and resolution are introduced. Spring. *Prereq: 1/C standing.*

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. Summer. *Prereq: NL310 and permission of department chair.*

NL450 Social Inequality (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. Fall 2011-2012. *Prereq: NL310.*

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. Counts for Humanities-Social Science credit. Fall 2011-2012. *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. Counts for Humanities-Social Science credit. Fall, Spring. *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.*

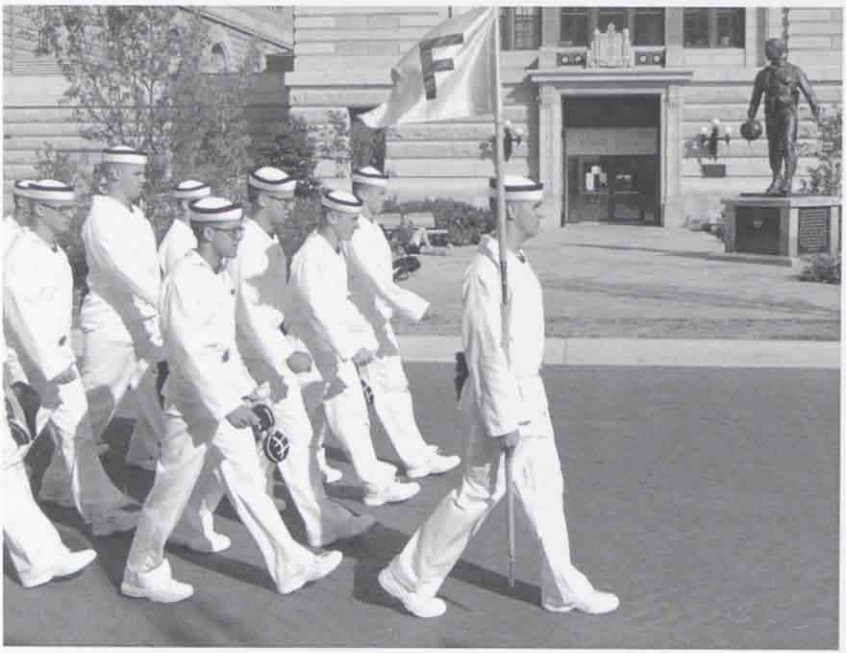
NP335 Comparative Study of Religion (3-0-3). This course is designed as an introduction to the study of religion through the examination and comparison of concepts and themes central to human cultures. Examples are drawn primarily from the ancient Near East (including ancient Israel and Iran), China, 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. Fall. *Prereq: none.*

NP336 Philosophy of Religion (3-0-3). This course 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. Counts for Humanities-Social Science credit. Fall, Spring. *Prereq: 1/C or 2/C or permission of department chair.*

NP340 Philosophy of Science (3-0-3). Everyone learns science from textbooks and tried-and-true lab experiments, 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 processes 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 for all General Science majors) Counts for Humanities-Social Science credit. Fall 2011-2012. *Prereq: 1/C or 2/C 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? Fall. *Prereq: NE203.*

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 rather 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. Spring. *Prereq: NE203.*



Division of Character Development and Training

The Honor Department
The Training Department
The Character Development Department

Division of Character Development and Training

The Division of Character Development and Training encompasses three key areas in the Academy's course of study required of all midshipmen: the Honor Department, the Training Department, and the Character Development Department.

The Honor Department

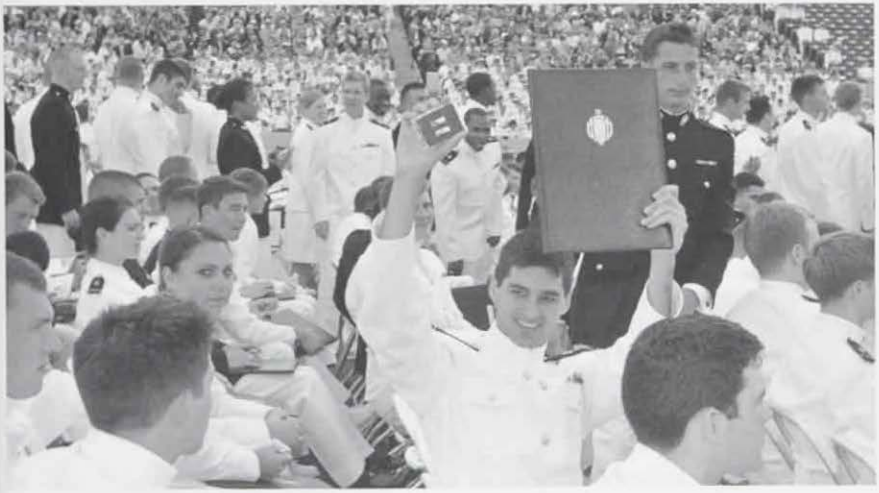
The Honor Department administers the Honor Concept for the Brigade of Midshipman. Working with Brigade Honor Staff, the department guides midshipmen through a four-year progression regarding the Honor Concept. The Honor Department also coordinates honor hearings and remediation efforts in the event of any violations.

The Training Department

The Training Department is responsible for all midshipman professional training conducted outside the academic classroom. A four-year training continuum–Midshipman Qualifications Standards (MQS), closely resembling standard fleet qualification programs–provides guidance and structure to the professional development of midshipmen. The continuum aligns a variety of programs–professional knowledge, Midshipman Leadership Development Guide, Saturday Morning Training–and integrates them into a coordinated curriculum. As a result of this training continuum each midshipman gains a base-line level of professional proficiency and competency prior to commissioning. The training begins on Induction Day (I-Day) during Plebe Summer, the foundation of each midshipman's four year professional development. The Training Department develops the Plebe Summer training requirements, plans the program to meet the requirement, and assesses the outcomes. Plebe summer and each of the subsequent three summers comprise the comprehensive Summer Training Program. This encompasses the dozens of activities that midshipmen participate in on the Yard and in assignments aboard Fleet units around the world. By exposing midshipmen to Fleet units in all warfare communities, the Summer Training Program enhances midshipman professional knowledge and allows each midshipman to make an informed decision regarding his or her eventual Service Assignment.

The Character Development Department

The Character Development Department is responsible for training midshipman on through the Command Managed Equal Opportunity Program (CMEO), the Alcohol and Drug Education Program and the Etiquette and Protocol Program. It also coordinates the Family Outreach Program for the Commandant of Midshipmen. Working closely with the Brigade Character Staff, the department sponsors a guest speaker lecture series and character-related briefings during Plebe Summer and throughout the academic year. This culminates in a midshipman's final year in the Capstone Seminar, which provides direct interaction between senior mentors and 1/C midshipmen before their eventual commissioning.

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Athletics

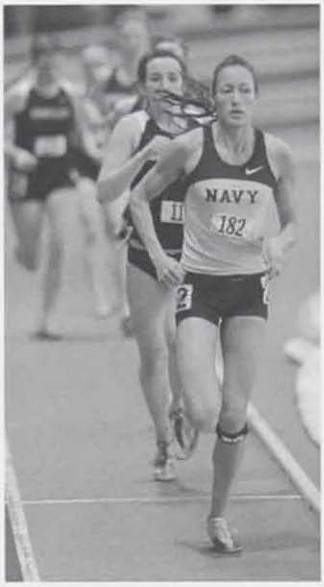
Just as the Naval Academy promotes the professional and intellectual development of midshipmen, so also must it fulfill its responsibility for each midshipman's physical development. This is met through an intercollegiate sports program that is one of the broadest in the nation—18 men, 11 women and three 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 achieve them. Our hope is that by the time they join the Fleet and Corps as junior officers, they will 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 our graduates to demonstrate as second nature.

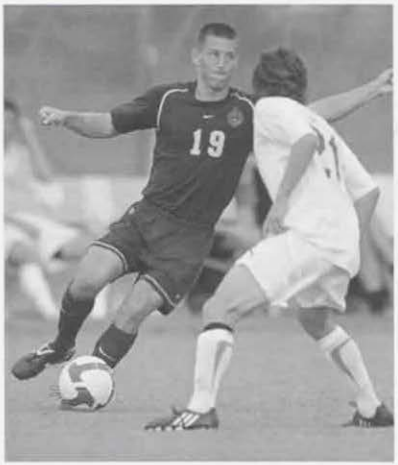
The roll call of varsity "N" winners at the Naval Academy reads like a veritable Who's Who in America—Rear Admiral Alan B. Shepard, the first American in space and a member of the heavyweight crew; Admiral Stansfield Turner, a former football lineman who became director of the Central Intelligence Agency; 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 basketball star David Robinson.

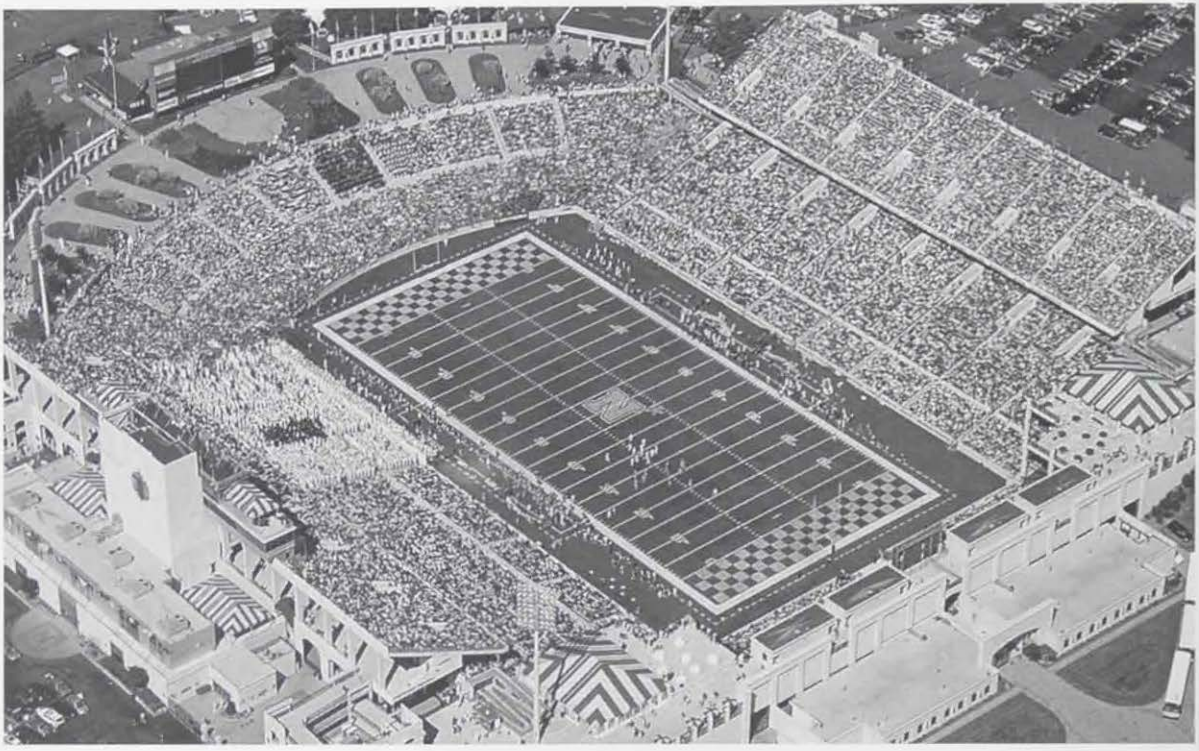
Over the years, Navy teams have been successful in both national and international arenas. Midshipman football teams have participated in the Rose, Sugar, Cotton, Orange, Holiday, Liberty, Aloha, Houston, Emerald, Poinsettia, Meineke Car Care and Eagle Bank Bowls. Navy's rivalry with Army is the greatest rivalry in all of college sports.

In 2009-10, Navy sports teams compiled a record of 294-173-2 (.629). Navy produced 14 All-Americans, eight Academic All-Americans, 13 Conference Athletes of the Year and won seven conference championships. The football team won a school record tying 10 games, a school-record seventh-consecutive Commander-in-Chief's Trophy and participated in a school-record seventh-consecutive bowl game. Navy has dominated Air Force and Army, winning a record 15-straight games against the other two service academies.

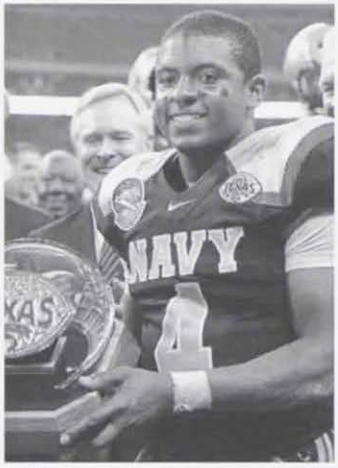


At the Naval Academy, all midshipmen actively participate in competitive sports, either at the intercollegiate, club or intramural level.





I feel the athletics at the U.S. Naval Academy go beyond the playing field. Naval Academy athletics prepare us physically, but also teach us crucial lessons in leadership that cannot be experienced in the Hall or in our leadership classes. Especially after playing sprint football for four years, I feel more prepared for the challenge of leading men into combat.
—Ensign Tyler Hawkins, Class of 2010



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 wrestling, 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
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
Tennis
Indoor Track
Outdoor Track
Volleyball

Co-Ed Sports
Rifle
Intercollegiate Sailing
Offshore Sailing

Director of Athletics

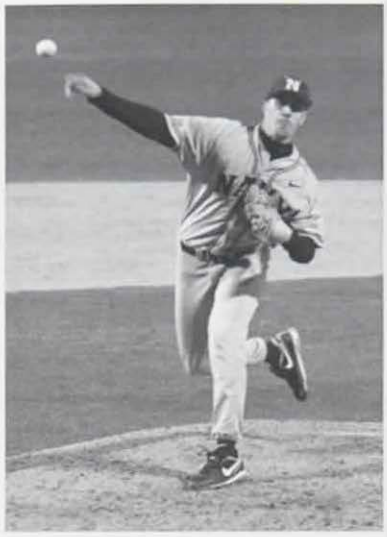
Chet Gladchuk became the 28th Director of Athletics at the Naval Academy in September 2001. Gladchuk held posts as athletic director at the University of Houston, Boston College University and Tulane University. A graduate of Boston College, Gladchuk was a letterwinner in football. He earned a master's in sports administration from the University of Massachusetts-Amherst.

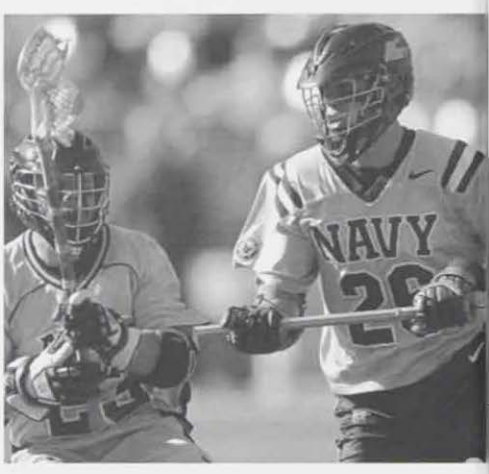
"At the Naval Academy, the athletic program is not just an extracurricular activity, it is part of the mission and as such receives a priority much different than at a civilian school. The athletic teams are an integral part of the overall education of a total person. Athletics provide leadership opportunities 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 are 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 midshipman companies in athletic competition. These competitions award points to midshipman 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, triathlon and men's volleyball.

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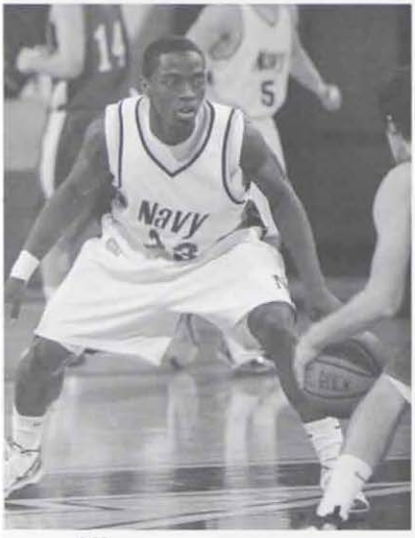
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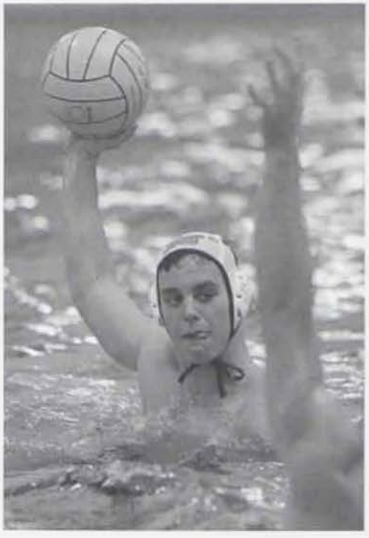
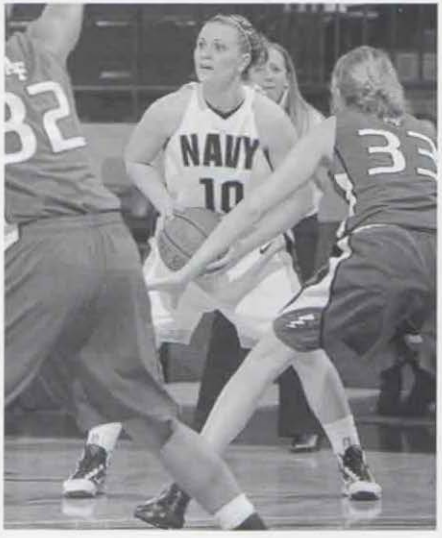


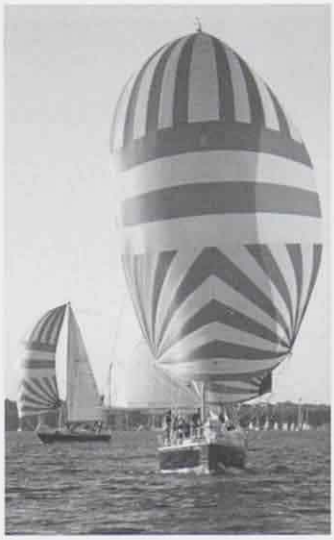

NAVY

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 recently-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
- **Ingram Field**, 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 200-meter track, basketball courts, state-of-the art 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
- **Terwilliger Brothers Field at Max Bishop Stadium**, a recently-renovated 1,500-seat baseball stadium with a newly-added Joe Duff Indoor Batting Facility
- 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 conditioning and combat preparedness
- The 155,000-square-foot **Brigade Sports Complex** features six hard-court surfaced indoor and outdoor tennis courts and an indoor ice hockey rink

The Naval Academy Athletic Association arranges varsity schedules and provides coaching staff, equipment and funding for the varsity athletic program.



Perseverance, stamina and sacrifice for the good of the team are invaluable lessons that I learned with the cross country team, and the caliber of the individuals with whom I have worked is unparalled. The sacrifice and dedication that it takes to be a student-athlete at the Naval Academy will transfer directly to my competency as a naval officer.
—Ensign Erica Ziel, former Women's Cross Country Team Captain, Class of 2010

Career Opportunities After Graduation

The Naval Academy develops 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. Nearly all physically qualified graduates are commissioned into the unrestricted line of the Navy or Marine Corps. There are limited opportunities for graduates to be commissioned in a restricted line or staff corps specialty such as: Supply Corps, Civil Engineer Corps, Information Dominance Corps, or Medical Service 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, ballistic missile and guided 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 embark upon after graduation.

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 preferences early during your senior year. Actual assignment to your future 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. 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 Power — Surface

The Navy's demanding and highly technical nuclear power training program is highly regarded world-wide. Those chosen for the program usually rank high in their class and have a solid background in scientific and technical courses, even though they may not have majored in these areas.

Midshipmen who are selected for 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 two nuclear reactor prototype sites before reporting to your second ship.

All aircraft carriers are nuclear powered and surface warfare officers alternate between these and conventionally powered ships as they advance in their careers.

Submarine Force

All of the Navy's submarines are nuclear powered. Those assigned to the submarine 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 two nuclear reactor prototype sites located in Charleston, S.C. and Ballston Spa, NY.

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, ballistic missile or guided missile submarines lasts about 36 months.

In a submarine, junior officers lead divisions of 10 to 20 sailors. 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 of the watch and officer of the deck — all steps towards earning the gold dolphins and designation as 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 will undergo training as either a pilot or a naval flight officer. Pilots fly aircraft while naval flight officers serve in the cockpit as weapons systems officers, electronic countermeasures officers and tactical coordinators.

After graduation from the Academy, all those asigned to aviation report to Pensacola, Florida, for Aviation Preflight Indoctrination. Pilot trainees may either stay in Pensacola or move to Corpus Christi, Texas, for basic flight training. Depending on the aircraft type assigned after basic flight training, 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.

Among the men who fought on Iwo Jima, uncommon valor was a common virtue.
—Admiral Chester W. Nimitz, Class of 1905

Marine Corps

Nearly 30% 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 worldwide.

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 for 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.

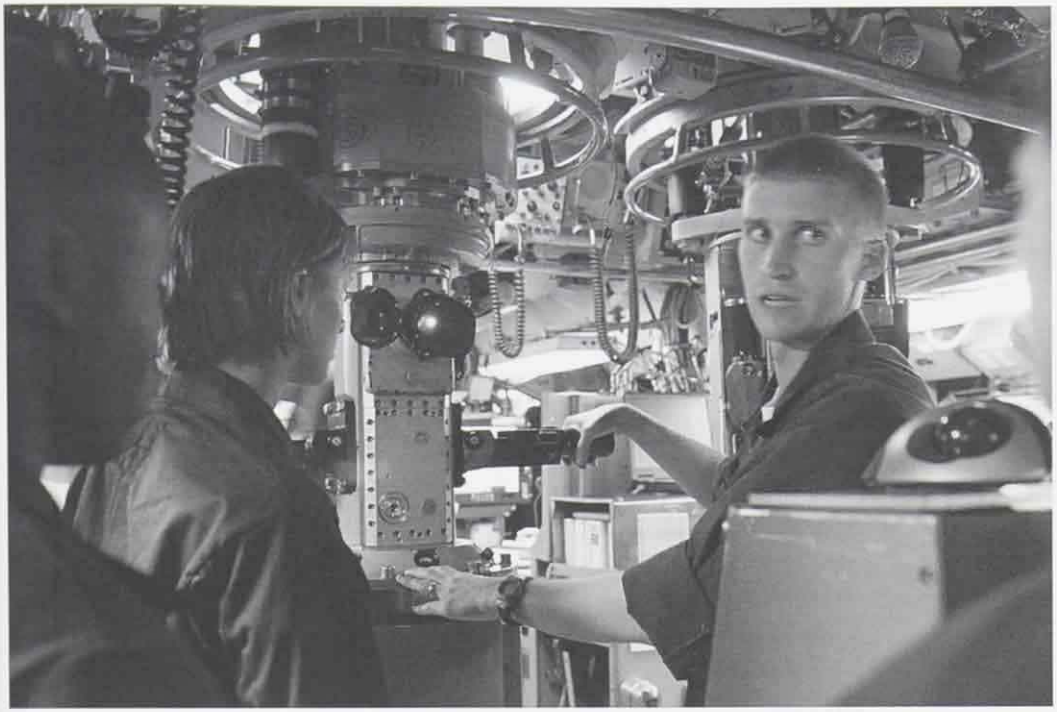
Restricted Line and Staff Corps Specialties

Midshipmen not physically qualified to serve in the unrestricted line but who can be commissioned as active duty officers may 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, information warfare, information professional, 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

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 2010

The members of the Class of 2010 chose the following service and warfare specialties to enter after graduation and commissioning:

Aviation:
- Pilot Training — 230
- Naval Flight Officer Training — 78

Surface Warfare:
- Conventional — 211
- Nuclear — 28

Marine Corps: 257

Submarine warfare: 138

Navy Restricted Line and Staff Corps: 17
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: 10

Special Warfare (SEAL): 27

Special Operations (diving, salvage and explosive ordnance disposal): 16

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	$ 2,745.00	$ 3,602.40	$ 4883.40
Subsistence	$ 223.04	$ 223.04	$ 223.04
Housing Allowance*	$ 1,449.00 (single)	1743.00 (single)	$ 1,968.00 (single)
	$ 1,836.00 (family)	$ 2,055.00 (family)	$ 2,343.00 (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.*

We become just by doing just acts, temperate by doing temperate acts and brave by doing brave acts . . . It makes no small difference, then, whether we form habits of one kind or another from our very youth; it makes a very great difference, or rather, all the difference.

—Aristotle

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.


UNITED
UNITED

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:

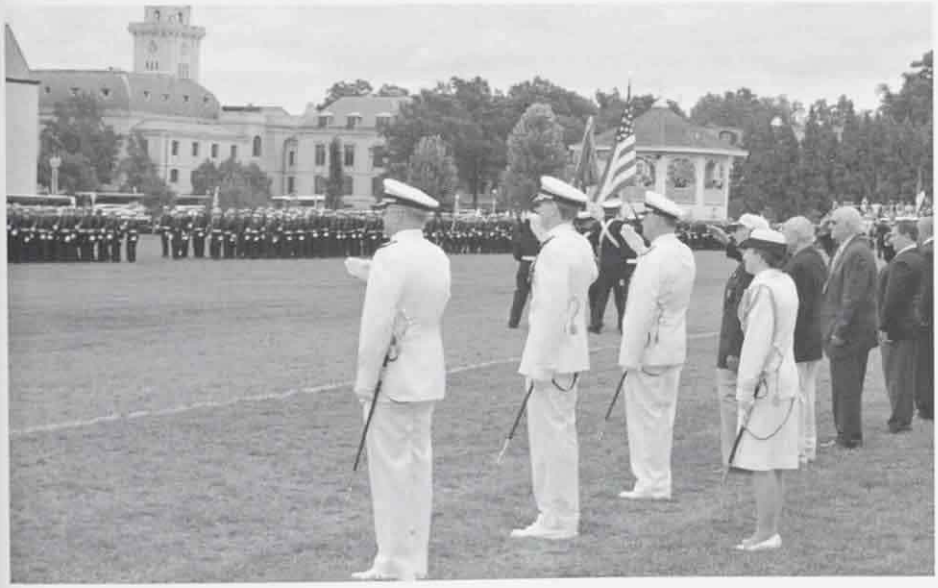
The Commandant of Midshipmen functions as the dean of students and is responsible for the moral, character and professional development of the Brigade of Midshipmen.

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 nearly 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 Deputy for Finance and 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 Chief Information Officer is the principal advisor to the Superintendent in all matters relating to information technology, enterprise infrastructure and the Academy's internal online data systems.

The Director, VADM 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.

Notable Accomplishments of U.S. Naval Academy Graduates

1 President of the United States

2 Cabinet members

8 Ambassadors

22 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 recipients

52 NASA astronauts

46 Rhodes Scholars

24 Marshall Scholars

101 Olmsted Scholars

31 FitzGerald Scholars

9 Gates Cambridge Scholars

4 John Nolan Scholars

4 Mitchell 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 of 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 2010-2011 Board of Visitors

Appointed by the President of the United States

Admiral John B. Nathman, USN (Ret.)

Mr. Mark C. Treanor - *Vice Chair*

The Honorable Nancy Johnson

Mr. Rick Michaels

Lieutenant General Frank E. Petersen, USMC (Ret.)

Mr. Albert Hawkins III

Appointed by the Vice President

The Honorable Barbara A. Mikulski
U.S. Senator, Maryland

The Honorable Ben L. Cardin
U.S. Senator, Maryland

The Honorable Lisa A. Murkowski,
Senator from Alaska

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 Rob Wittman
Representative, First District of Virginia

Supporting Organizations

Several private, non-profit organizations support the Naval Academy in important ways.

U.S. Naval Academy Alumni Association and 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 fundraising, institutional outreach, ("friend raising") and in pursuit of complementary and closely aligned missions.

The course set by Alumni Association founders in 1886 rings true today. The Alumni Association serves and supports our country, the naval service, the Naval Academy and its alumni. It pursues this mission 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, and continuous development of the Naval Academy and bind alumni together in support of the highest ideals of command, citizenship and government.

With a primary focus on institutional outreach ("friend raising"), the Alumni Association promotes informed advocacy for today's Naval Academy and Brigade of Midshipmen among its many constituents—especially USNA alumni, parents and friends. The Association keeps its more than 52,000 members informed through a network of more than 100 chapters around the world, 75 active class organizations and 84 parent clubs. The Association web site, *www.usna.com*; *Shipmate* magazine with eight issues a year and posted online; and other electronic and print publications are the primary communications tools. Other benefits and services serve to build affection to the Naval Academy and loyalty to its mission.

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.

Today's Naval Academy Foundation works closely with Academy leadership to identify our strategic and institutional priorities that offer a margin of excellence to 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.

Funding through private gifts has become essential to the strategic advancement of a dynamic and rapidly changing learning environment like the Academy's. Private giving has transformedthe Academy and is visible throughout the Yard in new or renovated buildings, privately-funded faculty positions, and exciting new programs which enhance the education of the Brigade of Midshipmen.
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,oneof the most extensive 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 410-293-8708. 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. The Museum has recently been renovated and features new exhibition galleries on two floors. On the first floor "Leadership and Service" explores the history of the Navy and the contributions of Naval Academy graduates in war and peace. The second floor exhibition 'Ship Models from the Age of Sail'" 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.

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, and the Center was renamed the Vice Admiral James B. Stockdale Center for Ethical Leadership.

The Center could not have a finer model as its namesake than this most distinguished graduate of the United States Naval Academy. Admiral Stockdale was a man of unsurpassed courage and integrity who clearly understood the gravity of a leader's moment of ethical decision. Consistent with this fundamental link between ethics and leadership, the Center redefined its mission: Empower leaders to make courageous ethical decisions. The Center seeks to accomplish this important mission through research, consultation, innovation, dissemination and facilitation.

Through research, the Center identifies and studies important emerging ethical leadership issues. Through consultation, it assists high-level leaders in tackling complex ethical leadership issues. Through innovation, the Center develops new ways to strengthen and accelerate ethical leadership development. The Center disseminates its learning and innovations via lectures, print publications, and multi-media, made available on the web. Through facilitation, the Center connects people, programs, and experiences. Through these efforts, and our broad reach and impact, the Vice Admiral James B. Stockdale Center for Ethical Leadership achieves its bold vision: Transform ethical leadership development worldwide.

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 (Corneal Refractive Surgery) performed with the excimer laser, including but not limited to photorefractive keratectomy, laser epithelial keratomileusis, and laser-assisted in situ keratomileusis are disqualifying if any of the following conditions are met: the pre-surgical refractive error in either eye exceeded a spherical equivalent of +6.00 or -6.00 diopters, pre-surgical 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 ophthalmologic solutions required and post-surgical refraction in each eye is not stable. Additionally, history of any incisional corneal surgery, including but not limited to partial or full thickness corneal transplant, radial keratotomy, astigmatic keratotomy, or corneal transplants are disqualifying.

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. This section provides a listing of major dental disqualifiers for admission to the Naval Academy. Disqualifying dental conditions include but are not limited to:

- Active caries (cavities) into the dentin that are not restored with serviceable restorations
- Unsatisfactory restorations, bridges, dentures, or implants;
- Missing teeth causing reduced chewing or biting efficiency. These can be replaced by well-designed bridges, partial dentures, or implants in good condition;
- Wisdom teeth causing symptoms must be removed. Asymptomatic impacted or partially impacted wisdom teeth are not generally disqualifying;
- Current orthodontic appliances for continued treatment are disqualifying. However, if you are undergoing active orthodontic treatment that will not be completed prior to your entry into the Naval Academy, you will be considered for a waiver. Retainer appliances are permissible, provided that active orthodontic treatment has been satisfactorily completed. In the event orthodontic treatment that was to be completed before I-Day cannot be completed, Admissions Medical must be notified immediately for consideration of a waiver. All waivers will be considered ona a case-by-case basis with discussion between your orthodontist and USNA Dental Clinic orthodontist. In general, if the orthodontic appliances are compatible for continued treatment at the USNA Dental Clinic, a waiver will be granted.

- Infections or chronic diseases of the soft tissue of the oral cavity;
- Necrotic (non-vital) or infected dental pulp or uncompleted root canal therapy;
- Marked malocclusion that requires early or prolonged treatment, involves tissue impingement on either facial or lingual/palatal gingival, or in some other way jeopardizes dental health;
- Severe or extensive apical or periodontal infection;
- Perforations from the oral cavity into the sinus 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.

Appendix B: Administration, Faculty and Staff

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5th-Adrienne Roseti, Lieutenant, USN
M.P.S., University of Maryland
6th-Joel Starzman, Lieutenant, USN
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7th-Jeffrey Lee, Captain, USMC
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8th-Adam Miller, Lieutenant, USN
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9th-,Samantha Macola, Lieutenant, USN
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10th-Vance Scott, Lieutenant, USN
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24th-Jason Reitz, Captain, USMC
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25th-Kenji Igawa, Lieutenant, USN
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26th- Magdalena Keel, Lieutenant, USN
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27th-Stephen Neuman, Lieutenant, USN
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28th-Michael Hlad, Captain, USMC
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30th-Katie Ball, Lieutenant, USN
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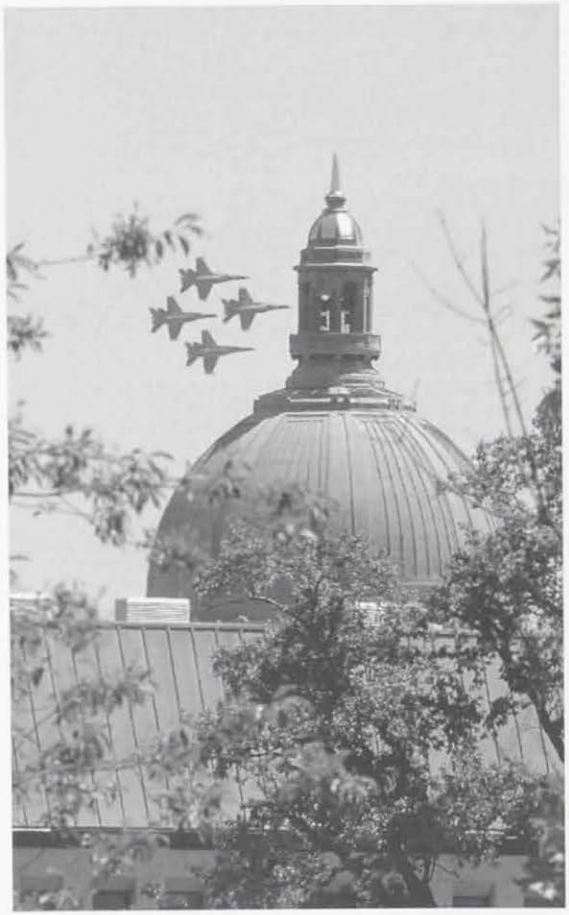

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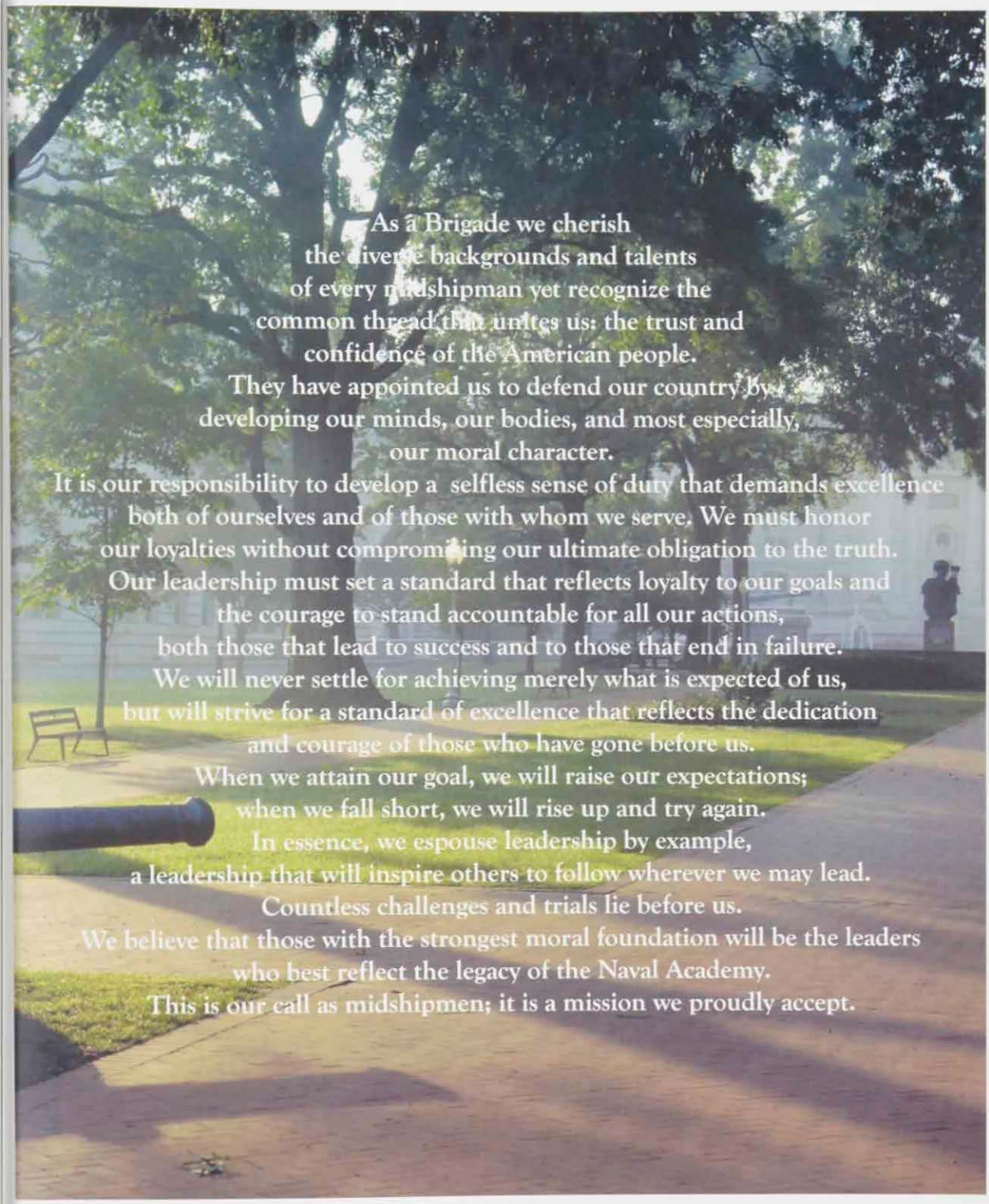
As a Brigade we cherish
the diverse backgrounds and talents
of every midshipman yet recognize the
common thread that unites us: the trust and
confidence of the American people.
They have appointed us to defend our country by
developing our minds, our bodies, and most especially,
our moral character.
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.