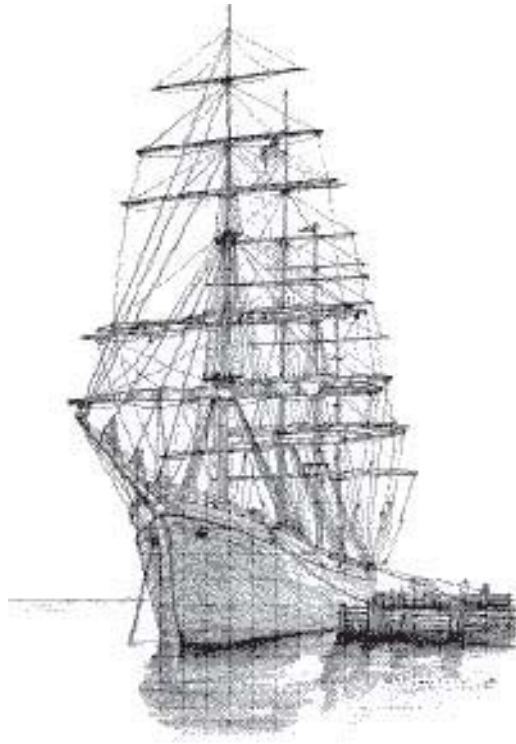


**UNITED STATES  
COAST GUARD ACADEMY**

**NEW LONDON, CT**



**CATALOG OF COURSES 2009-2010**

**Reservation of Rights**

This Catalog primarily reflects information regarding the Cadet Undergraduate Program for the Class of 2013.

The statements set forth in this catalog are for informational purposes only and may not be construed as the basis of a contract between a cadet and the U.S. Coast Guard Academy. Any conflict between this catalog and the applicable statutes or regulations shall be resolved by reference to language of the statute or regulation only.

The Academy reserves the right to change programs of study, academic requirements, course offerings, regulations, the teaching staff, the Critical Dates Calendar, and other matters described in the catalog without prior notice, in accordance with established procedures. The U.S. Coast Guard Academy endeavors to maintain the accuracy of all information provided in this catalog. However, it is the responsibility of the cadets to be aware of the current regulations, curriculum, and graduation requirements for their class and chosen major.

**Human Relations Statement**

The United States Coast Guard Academy is an equal opportunity employer guided by applicable Federal laws and regulations. The Academy is committed to the principles of fair treatment and equal opportunity. We recruit, educate, train and employ personnel based on merit so that each individual can excel and reach his/ her maximum potential without regard to gender, race, color, religion, national origin, reprisal, sexual orientation and/or where applicable, age (over 40) and/or physical or mental disability. The Academy is also committed to achieving and maintaining a multicultural environment that values the richness brought by diversity and encourages the full participation of all its members. To this end, we promote diversity and strategies to overcome under-representation, discrimination, and acts of intolerance, thereby creating a more positive and productive place in which to learn, work, and live. Furthermore, the Academy proactively pursues a leadership climate that fully embraces the Coast Guard's core values of Honor, Respect, and Devotion to Duty.

You, as a cadet and Coast Guard member, are strongly urged to dedicate yourself to these principles of fairness, valuing diversity, and respect to ensure they are fully embraced and carried out in your day-to-day actions.

Information about the Academy's Human Relations Program can be obtained from the Civil Rights Officer (scr), U.S. Coast Guard Academy, 15 Mohegan Avenue, New London, CT 06320-4195.

*SUPERINTENDENT'S MESSAGE*

Greetings from all of us at the United States Coast Guard Academy. We are proud of our role in developing leaders of character for the Coast Guard, which is a military, maritime, and multi-mission organization. We are the smallest of the five armed forces, and I believe that the more you learn about us the more you will be interested in becoming a part of our heritage.

As the smallest and perhaps most distinctive of the four armed service academies, our mission is to graduate leaders of character who will serve as commissioned officers in the Coast Guard. We have excelled at that mission for over 130 years. The talent of our officer corps is highly regarded by the citizens of this nation, and considered by many to be the best in government. Every day here is devoted to developing these future leaders.

Our academic program is among the nation's best as reflected in the national rankings and by our accreditation status. The classes here are small, our faculty is accessible, and they love their work. All members of our faculty have advising responsibilities. After demonstrating success in the Coast Guard, 80% of our graduates go on to attend the finest graduate schools in America, at our expense and at full salary.

My most important responsibility as Superintendent is the safety, security, and personal development of every cadet. You deserve the best, and so do the men and women of the Coast Guard our officers will lead after graduation. My promise is that I will do my very best to care for each cadet, while at the same time challenging them to maintain the highest personal standards of honor, respect, and devotion to duty.



**Rear Admiral J. Scott Burhoe, USCG**  
Superintendent, U.S. Coast Guard Academy

*DEAN'S MESSAGE*

On behalf of the Academic division, welcome to the United States Coast Guard Academy.

The Academy experience is one that is filled with exciting challenges and is focused on the intellectual, physical and professional growth of our future Coast Guard leadership.



The present-day world is a dynamic environment that demands well-developed critical thinking skills, a strong ability to communicate, and a relentless desire to learn. Coast Guard officers possess sharp minds, demonstrate sound leadership competencies, and value the importance of teamwork while living and breathing the Coast Guard Core Values of Honor, Respect, and Devotion to Duty.

The Academy's core curriculum is firmly based in the arts and sciences with a breadth of technical and professional exposure that serves as the nucleus of each academic major. Rigorous in-depth study in a chosen area is a natural follow on that provides opportunity for collaborative projects and self-managed intellectual work, frequently directed at analyzing and solving real world problems. Each academic program is subjected to internal and external oversight that provides valuable feedback for continual improvement within our demanding higher education environment. Our taxpayers and our service deserve nothing less.

The Faculty at USCGA works very hard in making themselves available to you, the cadets, when you are in need of assistance of any kind. They work alongside other members of your individual development team in providing assistance above and beyond the classrooms and laboratories. In short, we are dedicated to fostering your success and allowing each of you to reach your full potential.

This book contains valuable information about academic programs, support services, graduation standards and interesting curricular and extracurricular opportunities. I hope that you will find it useful and will refer to it often.

Semper Paratus,  
**Kurt J. Colella, Ph.D., P. E.**  
Dean of Academics Captain, USCG (retired)

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## PART I — INTRODUCTION

The United States Coast Guard Academy at New London, Connecticut, is one of the five Service Academies of the Armed Forces of the United States. It is supported by the Federal Government and operated within the authority of the Department of Homeland Security. It is a highly respected institution offering a superb undergraduate education. It is the principal source of technical degreed graduates for the United States Coast Guard officer corps.

### *ACADEMY MISSION STATEMENT*

The United States Coast Guard Academy is committed to strengthening the nation's future by educating, training, developing, and inspiring leaders of character who are ethically, intellectually, professionally, and physically prepared to serve their country and humanity, and who are strong in their resolve to build on the long military and maritime heritage and proud accomplishments of the United States Coast Guard.

### *CADET MISSION*

To graduate young men and women with sound bodies, stout hearts, and alert minds with a liking for the sea and its lore, and with that high sense of honor, loyalty and obedience which goes with trained initiative and leadership; well-grounded in seamanship, the sciences and the amenities, and strong in the resolve to be worthy of the traditions of commissioned officers in the United States Coast Guard in the service of their country and humanity.

### *PROGRAM OBJECTIVES*

The Coast Guard Academy is dedicated to producing Coast Guard officers who meet the program, diversity, and quality objectives of the Coast Guard. Within this broad perspective lie four primary objectives: (1) to provide, by precept and example, an environment that embraces the Coast Guard values of honor, respect, and devotion to duty; (2) to provide a sound undergraduate education in a field of interest to the Coast Guard, (3) to provide leadership education, and (4) to provide training which enables graduates to assume their immediate duties as junior officers afloat.

To ensure that we produce quality officers who demonstrate the behaviors and leadership competencies that we hope to develop, the faculty and staff of the Coast Guard Academy has endorsed the following set of **Shared Learning Outcomes**:

#### *Leadership Abilities*

Graduates shall be military and civilian leaders of character who understand and apply sound leadership principles and competencies. This includes the ability to direct, develop, and evaluate diverse groups; to

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function effectively and ethically as a leader, follower, facilitator or member of a team; and to conduct constructive assessment of self and others;

### ***Personal and Professional Qualities***

Graduates shall maintain a professional lifestyle that embraces the Coast Guard Core Values of Honor, Respect and Devotion to Duty, including physical fitness and wellness, and demonstrating the customs, courtesies and social skills befitting members of a maritime military service. Graduates shall also have a sense of Coast Guard maritime heritage and an understanding of the roles that the Coast Guard and the nation play in the global environment;

### ***Ability to Acquire, Integrate and Expand Knowledge***

Graduates shall have developed the motivation and skills for “lifelong learning”. Graduates shall be able to create a working conceptual framework that lends itself to continued expansion. To accomplish this, graduates shall be able to efficiently access a broad range of information sources, locate and interpret desired data reliably, employ appropriate technology, and integrate the specific in-depth knowledge required of both an academic major and an entry-level professional assignment;

### ***Communication Effectiveness***

Graduates shall be able to write clearly, concisely, persuasively, and grammatically; prepare and deliver well-organized and polished oral presentations; read and understand a variety of written materials; listen thoughtfully to oral arguments; respect diverse opinions; and formulate reasoned alternatives and responses;

### ***Critical Thinking Ability***

Graduates shall be able to accomplish complex tasks in a broad range of contexts by applying the basic skills of critical analysis, systems thinking, quantitative reasoning, risk management, creative problem solving, and value-based decision-making.

These outcomes were developed by analyzing the intellectual, physical, and professional job demands of Coast Guard officers and by comparing those to the developmental experiences for which the Coast Guard Academy is responsible. Graduates of the Academy earn commissions as Ensigns in the U.S. Coast Guard, thus beginning their service to the nation and humanity in the nation’s oldest seagoing service. The four years that cadets spend at the Coast Guard Academy are the beginning of their professional development as leaders and career Coast Guard Officers.

To understand the degree to which we are successful in achieving these outcomes, cadets, graduates, and program customers will periodically participate in outcome assessment activities, such as tests, surveys, interviews, and portfolio development. Outcome assessment cuts across specific disciplines, majors, or



## *Catalog of Courses*

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divisions and is part of our commitment to continually improve all of our programs.

To accomplish our institutional mission to develop “leaders of character,” the Academic, Athletics, and Cadet Divisions work closely together: leadership education takes place in the classroom, in the barracks, on the athletic fields. The faculty and staff across the institution contribute to the development of the total person. Leadership across the curriculum mandates that leadership education is not merely relegated to the core leadership courses but that all faculty and staff address leadership issues whenever possible.

### ***ACADEMY MILESTONES***

- 1790 Alexander Hamilton developed fiscal plans and economic policies for the United States. On August 4, 1790, Congress passed the Tariff Act, creating a United States Revenue Cutter Service.
- 1876 Legislation was passed granting permission to establish a cadet-training program within the U.S. Revenue Cutter Service.
- 1876 The first home for the “Academy” was established on the Revenue Cutter DOBBIN. Nine cadets were selected by competitive examination.
- 1902 “Scientiae Cedit Mare” was adopted as the Academy motto.
- 1915 The Life Saving Service joined the Revenue Cutter Service to form the “U.S. Coast Guard”.
- 1932 The Academy moved from Fort Trumbull to its present location.
- 1939 The Academy was accredited by the Engineers’ Council for Professional Development (ECPD) under “General Engineering”.
- 1940 The Academy was accredited by the Association of American Universities.
- 1940 The Academy was given authority to grant Bachelor of Science degrees.
- 1946 The Barque EAGLE, a prize of war, was commissioned into the U.S. Coast Guard.
- 1952 The Academy was accredited by the New England Association of American Schools and Colleges (NEASC).
- 1966 First African-American Academy graduate.
- 1973 Electrical, Marine, and Ocean Engineering programs were accredited by ECPD.
- 1976 Women cadets were first admitted to the Academy.
- 1978 The Civil Engineering program was accredited by ECPD.
- 1980 Engineers’ Council for Professional Development (ECPD) renamed the Accreditation Board for Engineering and Technology (ABET).
- 1996 The Mechanical Engineering program was accredited by ABET.
- 1998 The Leadership Development Center opened.

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## *U. S. Coast Guard Academy*

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2005 The Academy and its Management degree program received initial accreditation by AACSB International - the Association to Advance Collegiate Schools of Business.

### ***INSTITUTIONAL ACCREDITATION***

The U.S. Coast Guard Academy is accredited by the New England Association of Schools and Colleges, a non-governmental, nationally recognized organization whose affiliated institutions include elementary schools through collegiate institutions offering postgraduate instruction.

Accreditation of an institution by the New England Association of Schools and Colleges indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer group review process. An accredited school or college is one that has available the necessary resources to achieve its stated purposes through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation.

Accreditation by the New England Association applies to the institution as a whole. As such, it is not a guarantee of the quality of every course or program offered, or of the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

The Academy concluded a comprehensive review conducted by NEASC in the fall of 2000 and received the following comments at the conclusion of that review: "Continuation of the United States Coast Guard Academy's accreditation is based upon the Commission's finding that the institution's fulfillment of the Standards for Accreditation is commendable in virtually every respect. It is readily apparent that the Academy's admirable mission and purposes are fully supported by its institutional resources and that it provides an education of the first order."

Inquiries regarding the status of the U.S. Coast Guard Academy's accreditation by the New England Association of Schools and Colleges should be directed to Academy administrative staff. Individuals may also contact the Association: New England Association of Schools and Colleges, 209 Burlington Road, Bedford, MA 01730-1433.

### ***PROFESSIONAL ACCREDITATION***

The Naval Architecture and Marine Engineering, Civil Engineering, Electrical Engineering, and Mechanical Engineering majors are accredited by the Engineering Accreditation Commission of ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 – telephone: (410) 347-7700.

The Academy and its Management degree program are accredited by AACSB International - the Association to Advance Collegiate Schools of Business.

***DISCLOSURE OF INFORMATION***

The Privacy Act of 1974 provides to individuals certain safeguards against an invasion of personal privacy. Specific items of information requested by a person about another person are prohibited from disclosure. Cadets and other government employees shall not disclose the home address, home telephone number, number of dependents, withholdings, allotments, and social security number of cadets or Coast Guard employees. However, the name, rank or rate, date of rank, salary, duty status, past, present and future duty station, duty station address, office telephone, source of commission, military and civilian education level and promotion sequence number may be revealed to anyone who submits a Freedom of Information Request.

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***CRITICAL DATES CALENDAR***

<i>Event</i>	<i>2009-2010</i>	<i>2010-2011</i>	<i>2011-2012</i>	<i>2012-2013</i>
4th Class Reporting Day	29 Jun	28 Jun	27 Jun	25 Jun
Summer Program End	16 Aug	15 Aug	13 Aug	11 Aug
Cadet Admin Processing	17-21 Aug	16-20 Aug	15-19 Aug	13-17 Aug
Convocation	20 Aug	18 Aug	17 Aug	15 Aug
Class Start-Fall Semester	24 Aug	23 Aug	22 Aug	20 Aug
Labor Day	7 Sep	6 Sep	5 Sep	3 Sep
Parents' Weekend	25-27 Sep	8-10 Oct	14-16 Oct	TBD
Homecoming	9-11 Oct	1-3 Oct	23-25 Sep	TBD
Columbus Day	12 Oct	11 Oct	10 Oct	8 Oct
Veterans' Day	11 Nov	11 Nov	11 Nov	12 Nov
Thanksgiving Leave	25-29 Nov	24-28 Nov	23-27 Nov	21-25 Nov
Last Class Day-Fall Sem	9 Dec	8 Dec	7 Dec	12 Dec
Study&Conf Day-Fall Sem	10 Dec	9 Dec	8 Dec	13 Dec
Exam Period-Fall Sem	11-17 Dec	10-16 Dec	09-15 Dec	14-20 Dec
Winter Leave	18 Dec-3 Jan	17 Dec-4 Jan	16 Dec-3 Jan	21Dec-6 Jan
Mid-Year Admin Processing	4-8 Jan	5-8 Jan	4-7 Jan	7-11 Jan
Class Start-Spring Sem	11 Jan	10 Jan	9 Jan	14 Jan
Martin L. King, Jr. Day	18 Jan	17 Jan	16 Jan	21 Jan
Presidents' Day	15 Feb	21 Feb	20 Feb	18 Feb
Spring Leave	6-14 Mar	5-13 Mar	3-11 Mar	9-17 Mar
Last Class Day-Spring Sem	28 Apr	27 Apr	25 Apr	1 May
Undrgrd Resrch Symp Day	29 Apr	28 Apr	26 Apr	2 May
Study & Conf Day-Spring Sem	30 Apr	29 Apr	27 Apr	3 May
Exam Period-Spring Sem	1-7 May	30 Apr-6 May	28 Apr-4 May	4-10 May
Summer Training Begins	8 May	7 May	5 May	11 May
Graduation	19 May	18 May	16 May	22 May
Summer Term	14 Jun-23 Jul	13 Jun-22 Jul	18 Jun-27 Jul	17 Jun-26 Jul

## **PART II**

# **ORGANIZATION AND RESOURCES**



*Hamilton Hall*

Academy personnel and facilities are organized into the rigorous and supportive learning environment needed by Cadets for their educational, professional, military, physical, and spiritual development. The Academic Division, Cadet Division, and Athletics Division develop and provide the core programs that define those functions and activities needed to support the Service Academy legacy. Coast Guard Headquarters, the Board of Trustees, Superintendent's Office, and the Divisions of Admissions, Comptroller, Information Services, Facilities Engineering, and the Health, Safety and Work Life Field Office all collaborate to provide critical direction and support for cadet programs. These organizations and their resources form an Academy community that is dedicated to providing a rich and rewarding learning experience for future Coast Guard Officers.

### ***BOARD OF TRUSTEES***

The Board of Trustees has cognizance of all programs at the Coast Guard Academy. The Board provides guidance and advice to the Superintendent, the Chief of Staff, and the Commandant in the following areas:

1. Reviewing the mission and purpose of the Academy.
2. Supporting the Superintendent.
3. Assessing Board performance.
4. Keeping current the Academy strategic plan, including the facilities master plan.
5. Reviewing programs that impact the total Academy experience including the academic, professional, and athletic programs.
6. Ensuring adequate resources are provided to meet the Academy mission.
7. Ensuring good management practices are followed at the Academy.
8. Ensuring the accreditation of the various academic curricula.

## **ADMISSIONS DIVISION**

The mission of the Admissions Division is to attract prospective Cadets who are suited to develop into future leaders and officers in the United States Coast Guard. The division is responsible for coordinating recruiting, outreach and orientation programs, and evaluating and selecting candidates for appointment to the U.S. Coast Guard Academy.

### ***Requirements***

The U.S. Coast Guard Academy offers appointments on the basis of a nationwide merit-based competition. Those who are accepted are distinguished by proven academic accomplishment, skills as an athlete, a record of community service or part-time employment, motivation to embrace leadership development, and an unwavering desire to serve their country and humanity. Applicants must be a U.S. citizen between the ages of 17-22 years old upon entering the Academy. They must be unmarried with no dependants or financial debt and possess a high school diploma or GED (or will prior to entry). Most successful candidates graduate in the top 15% of their high school class and demonstrate proficiency in both mathematical and applied science fields. Applicants must complete the SAT or ACT (with Writing Test) exam prior to or during January test administration of the year of entry.

Appointments to the U.S. Coast Guard Academy are tendered on a selective basis. Congressional nominations are not required. The only special category is International Cadets. By statutory limitations, the Academy may have a maximum of 36 International Cadets enrolled at any one time, and candidates seeking admission as an International Cadet must apply through the Defense Attaché Office of their U.S. Embassy.

### ***Application***

Application to the Academy is free, online, and completely secure. Applicants can access the online application directly for the Academy's website, [www.uscga.edu](http://www.uscga.edu). Applicants must submit the online application and essays, official SAT or ACT (with Writing Test) exam scores, an official high school transcript, three instructor evaluations, and complete a physical fitness examination. Applicants must also complete a medical exam with the Department of Defense Medical Examination Review Board (DoDMERB). The application is available each year in late summer with specific deadlines published on the website.

The application to the Academy consists of three parts. Taken in whole, the completed application allows Admissions to select students who are best suited for appointment to the Coast Guard Academy.

## *Catalog of Courses*

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### *Application Part One*

Required? Yes  
Deadline? 1 February (year of entry)  
Contents? Online Application

### *Application Part Two*

Required? Yes  
Deadline? 1 February (year of entry)  
Contents? Online Essays, High School Transcript, Standardized Test Scores (SAT or ACT with Writing Test), Instructor Evaluations, Physical Fitness Examination or Candidate Fitness Assessment, and Commanding Officer's recommendation for active duty and reserve personnel.

These forms can be found on our website with Part One. Applicants must download or print a supplemental forms package to be completed and returned to the Admissions Office.

### *Application Part Three*

Required? Yes  
Deadline? 1 June (year of entry) - Applicants must be found medically qualified for admission  
Contents? DoDMERB Medical Examination  
Information on scheduling this medical exam is mailed to applicants by DoDMERB after they submit Part One.

## *CONTACTING THE ADMISSIONS DIVISION*

To contact the Admissions Division use the information below or refer to listings on the website.

U.S. Mail: Director of Admissions  
U.S. Coast Guard Academy  
31 Mohegan Avenue  
New London, CT 06320-8103

Telephone: 1-800-883-USCG  
1-860-444-8503

Web: <http://www.uscga.edu>  
<http://admissions.uscga.edu>

## **ACADEMIC DIVISION**

The Academic Division, headed by the Dean of Academics, consists of the Library, Registrar's Office, Academic Support Services, and the following academic departments of instruction: Engineering, Humanities, Management, Mathematics, and Science. The Division offers eight academic majors – Civil Engineering, Electrical Engineering, Mechanical Engineering, Naval Architecture and Marine Engineering, Government, Management, Operations Research and Computer Analysis, and Marine and Environmental Sciences. Offices and academic departments are staffed through the competitive appointment of permanent civilian, permanent military, and rotating military faculty.

The Academic Division is responsible for providing a four-year academic program that leads to a Bachelor of Science degree and a commission as an Ensign in the United States Coast Guard. The curriculum is constantly reviewed to ensure that it meets the needs of the Service; therefore, the pattern and content of the courses described in this catalog may be revised at any time without prior notice.

The mission of the Academic Division is to develop the intellectual abilities and nurture the attitudes and aptitudes that will produce officers who are intellectually curious and have a life-long thirst for continuous self-improvement, with a commitment to service and ethical practice. The Division accomplishes this in several ways. It affords challenging classroom and laboratory experiences that promote intellectual growth. It offers a curriculum that fosters the achievement of Coast Guard Academy Shared Learning Outcomes by providing a strong background in science and technology, a sound foundation in the liberal arts, and an in-depth concentration in a major field of study having value to the Coast Guard. It presents a curriculum that positions our students for acceptance into graduate schools, and it provides intellectual resources through partnerships responsive to the Commandant's Directions.



***ENGINEERING DEPARTMENT***



*McAllister Hall*

The Department of Engineering provides a nationally recognized high quality engineering education. While designated a department within the Academy organizational structure, it would function as a school of engineering in the civilian education community.

Within the Department, there are four majors, all accredited by ABET, Inc. They are Civil Engineering, Electrical Engineering, Mechanical Engineering, and Naval Architecture and Marine Engineering. Each of these majors is administered by a section that would function as a department of engineering in a civilian institution.

Graduates of the engineering majors have an outstanding record of accomplishment in graduate school. Approximately half of the majors are selected for several graduate programs fully funded by the Coast Guard. Successful candidates are assigned to various universities and their only duty is to attend school. Others take advantage of tuition assistance and attend graduate programs in off-duty hours while in a professional Coast Guard assignment. Other graduates, who leave the active Coast Guard following completion of their five-year obligation, often go on to respected graduate programs nationwide. All told, over 80% of engineering graduates of the Academy go on to obtain graduate degrees.

**The mission of the Department of Engineering is:**

1. To provide an excellent undergraduate engineering education, strong in fundamentals, supportive of the Mission of the U.S. Coast Guard Academy, and sufficient in number to adequately serve the needs of the Coast Guard.
2. To maintain a quality curriculum closely reflecting current technologies, and an environment which fosters continuous development of students, faculty, and staff.
3. To contribute as a unique intellectual resource to the Coast Guard and the Department of Homeland Security by involving cadets and faculty in real-time projects when able.

4. To satisfy the Program Educational Objectives for each respective program.

**Engineering Program Educational Objectives:**

U.S. Coast Guard Academy engineering programs produce graduates who:

1. Are prepared for professional practice in engineering positions as U.S. Coast Guard junior officers.
2. Are prepared for a variety of U.S. Coast Guard career paths, based on their abilities to apply fundamental engineering principles in a dynamic technological environment.
3. Have the ability and a desire to continue to grow intellectually and professionally. In addition, the Civil Engineering program produces graduates who are prepared to provide appropriate civil engineering expertise to the U.S. Coast Guard.

In addition, the Electrical Engineering program produces graduates who are prepared to provide appropriate electrical engineering expertise to the U.S. Coast Guard specifically including the areas of Command, Control, Communications, Computers, and Information Technology (C4IT).

In addition, the Mechanical Engineering program produces graduates who are prepared to contribute to the safe design, construction, repair and operation of Coast Guard mechanical engineering systems.

In addition, the Naval Architecture and Marine Engineering program produces graduates who are prepared to assume responsibility for the safety, operation, maintenance, logistics, design, and repair of ships and boats.

Outcomes of all programs within the Department of Engineering include producing graduates who have:

1. An ability to apply knowledge of mathematics, science and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. An ability to function on multidisciplinary teams.
5. An ability to identify, formulate, and solve engineering problems.
6. An understanding of professional and ethical responsibility.
7. An ability to communicate effectively.
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

## *Catalog of Courses*

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9. A recognition of the need for, and an ability to engage in life-long learning.
10. A knowledge of contemporary issues.
11. An ability to use techniques, skills, and modern engineering tools necessary for engineering practice.

Once commissioned in the Service, Department of Engineering graduates go on to assignments in every area of the Coast Guard. Engineers are preferred for filling approximately one third of the jobs in the Coast Guard. There are many positions assigned exclusively to engineers. However, this does not mean that engineering graduates are limited to technical assignments. While engineering careers are the most often selected, many alumni pursue careers in other fields. Notable non-engineering assignments that have been held by Academy engineering graduates include Commandant of the Coast Guard, Superintendent of the Coast Guard Academy, Aide to the President of the U.S., Aide to the Secretary of Transportation, NASA astronauts, and many others. In fact, engineering graduates are eligible for every assignment in the Service.

## *HUMANITIES DEPARTMENT*



*Satterlee Hall*

The Department of Humanities provides the essential liberal arts foundation of the academic curriculum at the Coast Guard Academy. The core courses offered in the Department enrich the writing, critical thinking, and public speaking skills of all cadets while imbuing them with an appreciation for national and global challenges to governance and an understanding of their unique roles as citizen/officers. The Department sponsors a number of learning opportunities for cadets outside the classroom, including the Washington Intern Program for first class cadets; the Model UN team, which competes internationally; and the Society for Policy and International Affairs, which travels yearly to New York City and Washington, D. C.

The Department offers a single major in Government. The Government Major provides cadets a broad understanding of governmental systems and their cultural, historical, theoretical, and jurisprudential underpinnings. The major offers two tracks for focused study in Public Policy or International Affairs. To supplement these tracks, cadets may also take courses in law, strategic intelligence, and Spanish. Additional study in history, philosophy, and literature provides cadets in the Government Major a broad educational experience. Advanced students may

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pursue research opportunities in specialties represented by over twenty faculty. Select students in the major may also pursue advanced research projects in policy related to Coast Guard and Department of Homeland Security initiatives. The Department is a member of the American Political Science Association and sponsors cadet membership in Pi Sigma Alpha, the National Political Science Honor Society.

The Government Major prepares graduates to serve in almost any career path in the Coast Guard. Government majors are to be found commanding cutters or shore stations, heading policy offices, negotiating treaties on behalf of the U.S. government, leading regulatory projects, and flying aircraft, reflecting the maxim that a liberal undergraduate education recognizes no limits. The Government Major equips graduates with an excellent background for postgraduate study in a variety of disciplines.

### ***MATHEMATICS DEPARTMENT***

The Department of Mathematics is staffed by civilian and military faculty. The focus is on support of the Academy's Shared Learning Outcomes, the Operations Research and Computer Analysis (ORCA) major, and the broad technical core curriculum.

The Operations Research and Computer Analysis major provides graduates a background in mathematics, statistics, and computer analysis. The primary focus is to enable cadets to conceptualize and describe reality using the tools of mathematics and statistics, analyze possible models and solutions, use appropriate computer technology, apply these skills to specific Coast Guard problems, and effectively communicate solutions. The study of Operations Research and Computer Analysis highlights for cadets the means by which mathematics and computers can be used to analyze complex problems and improve decision-making. Department of Mathematics core courses include Introduction to Calculus, Calculus I, Calculus II, and Probability and Statistics. Major courses, many of which are also incorporated into the curriculum of other departments, include Multivariable Calculus, Differential Equations, Probability Theory, Mathematical Statistics, Linear Regression, Visual Basic, Information Systems, Discrete Mathematics, Linear Algebra, Decision Models, Linear Optimization, Network and Nonlinear Optimization, Probability Models, Simulation with Risk Analysis, and the Cadet capstone course Operations Analysis.

The Department of Mathematics uses both mathematics and current technology to educate students of the highest caliber. The dedication and diverse mix of experiences of the faculty add a unique depth and flavor to a cadet's academic and military experiences at the Coast Guard Academy.

## *Catalog of Courses*

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### *SCIENCE DEPARTMENT*



*Smith Hall*

The Science Department consists of three sections: Chemistry, Marine Science, and Physics. It is responsible for the chemistry, physics and oceanography core courses as well as a large array of upper level courses. Faculty and cadets are involved in a wide range of projects that deal with interesting and important environmental issues. These include coastal food chains using isotope measurements, issues related to fisheries management, estuarine dynamics, and application of geospatial technologies to increasing the Coast Guard's Maritime Domain Awareness. Other activities involve a host of projects relating to environmental forensics, including the detection and identification of petroleum compounds in sea water samples, materials from suspected arson sites, and geochemical samples.

The Science Department offers a major in Marine and Environmental Sciences which provides a multi-disciplinary and technical education in marine and environmental sciences and is closely aligned with Coast Guard missions, including Homeland Security, Prevention and Response (e.g., marine environmental protection, oil and hazardous materials spill cleanup), Port Security, Fisheries Law Enforcement and Management, Search and Rescue, Ice Operations, and Aviation. The curriculum stresses understanding of the complex interactions between humans and their environment, especially the oceans, and the interplay between the scientific, regulatory and social aspects of marine resource management. Students may concentrate their course work in the biological, chemical, or physical aspects of the marine environment.

Resources used by students in the Marine and Environmental Sciences program include a 30-foot research vessel, chemistry and biology labs equipped with state-of-the art analytical instrumentation, and a computer laboratory. In addition to coursework, there are opportunities for independent research and summer internships, which allow students to be involved directly with Coast Guard operations or make extended visits to research labs where work related to the major is carried out. In addition, selected students are afforded the opportunity to spend Winter Leave on a USCG Polar-Class Icebreaker as it transits to McMurdo Antarctica, and interact with scientists at the National Science Foundation's Antarctic Research Center. Extensive use is made of the nearby Thames River estuary for

field studies and experiments.

The department maintains an astronomical observatory in nearby Stonington. Although it is not a required part of the major, many students in this and other majors take the astronomy course as an elective.

### ***MANAGEMENT DEPARTMENT***

The Department of Management, which functions much like a typical business school at civilian institutions of higher education, is internationally recognized for providing a high-quality business education. It is the smallest program of its kind in the world accredited by AACSB International—the Association to Advance Collegiate Schools of Business, the premier accrediting body for collegiate schools of business and accounting.

The mission of the Management Department is to create management expertise by challenging its students to become effective leaders and competent managers through a broad undergraduate business program. The Management degree program is guided by the emerging needs of the Coast Guard through its Advisory Board which is comprised of the Chief Financial Officer, the Chief Information Officer, the Chief of Personnel, and other program managers at Headquarters. The Management Department also enables Coast Guard management effectiveness through faculty scholarship and consulting.

Students in the Management major study and get exposed to a wide range of business disciplines, including accounting, finance, economics, management, behavioral/organizational science, marketing, strategy, human resource management, leadership, management of information systems, quantitative methods, operations management, and decision sciences. Graduates must demonstrate proficiency in leadership, communication, business competencies, and integration/critical thinking. The Management major is one of the largest at the Academy and graduates of the program receive a B.S. degree in Management. Additionally, two of the core curriculum courses, Macroeconomic Principles and Leadership and Organizational Behavior, are offered through the Management Department.

After graduation, Management majors find themselves well-suited for almost any career path in the Coast Guard. Immediately, upon their first assignment, Management majors will use much of the knowledge learned through their course of study – as almost all junior officers are called upon to be stewards and managers of the U.S. Coast Guard’s human, financial, and information resources. Graduates of the Management major have an outstanding record of academic achievement at graduate school. Many are selected by the Coast Guard to attend graduate school full-time and fully funded. Graduates have attended some of the most prestigious MBA programs in the country.

## ***GOVERNANCE***

### ***Academic Council***

The Academic Council serves as the faculty's formal agent for academic program evaluation, review, development and assessment; faculty recruitment and professional development; graduation standards; and the standards and policies for the core, admission into the major, grading, academic honors, probation and suspension. The council may address extraordinary academic problems and circumstances of individual students.

### ***Credentials Committee***

The role of the Credentials Committee is a source of peer review and evaluation of academic faculty qualifications and scholarly accomplishments. The purpose of the Committee is to ensure that equitable standards are applied to all faculty members and that proper recognition is accorded to faculty scholarship. As a group of the most senior faculty they also serve as advisors to the Dean of Academics.

### ***Curriculum Committee***

The Curriculum Committee's primary responsibility is to provide guidance on curricular issues to the Dean of Academics and the Academic Council. The Committee reviews and comments on any proposed changes to courses and also discusses and promotes the curricular philosophy and structure of the Coast Guard Academy.

### ***Dean's Cabinet***

The Dean's Cabinet, consisting of academic department heads, contributes an ongoing dialog and shapes the Academic Division's strategic thinking and academic planning, especially in curricular areas.

### ***Faculty Senate***

The Faculty Senate represents the Coast Guard Academy military and civilian faculty and aspires to inform the Superintendent of faculty opinion on matters of mutual concern. The Faculty Senate addresses matters relating to the common curriculum, academic standards, faculty professional development, criteria and methodologies for evaluating teaching effectiveness, grading policies, academic advising, program evaluation, instructional technology, innovative teaching methods, and other issues for which the Faculty are a primary source of professional expertise. The administration attempts to keep the Faculty Senate informed of pending academic issues so that the Faculty Senate may serve as a conduit for this information between and among the Faculty and the Academy administration.



## *CADET DIVISION*



*Chase Hall*

The Cadet Division is responsible for directing, supporting, and managing the military and professional programs for the Corps of Cadets. The Cadet Division develops ethical leaders and lifelong learners while producing professional career military officers for the U.S. Coast Guard. Fundamental to their development, and ingrained in all Cadet Division activities, are the Coast Guard Core Values of Honor, Respect, and Devotion to Duty.

The Cadet Division is organized into four branches. The Commandant of Cadets is an active duty Coast Guard Captain (O-6) who fulfills the duties of the Cadet Division Chief, somewhat equivalent to a “Dean of Students.” The Commandant directly oversees a full-time staff of 100 people with an overall budget of \$2.3M. The Commandant of Cadets is located in Chase Hall: the four annex, 450room building that serves as the home for the 990 member Corps of Cadets.

**The Cadet Branch**, also located in Chase Hall, is responsible for the day to day administration of the corps including discipline and the general health and well being of the Corps of Cadets. Administered within the Cadet Branch are the Cadet Regiment, Cadet Company Officers, Cadet Musical and Vocal Activities, and the Cadet Social Development Program.

**The Cadet Training Branch** is responsible for the entire spectrum of training delivered to the Corps of Cadets across the 200 week course of instruction. Administered within the Training Branch are: Cadet Training, Career Development, Cadet/OCS Administration, and Weapons Training. It also serves as liaison to the fleet and to Coast Guard Cutter EAGLE, the Academy’s sail training vessel.

**The Waterfront, Seamanship and Sailing Branch** is located at the Academy waterfront on the Thames River. It is comprised of the Sail Training Section and the Waterfront Section and is responsible for, or the support of, all Academy conducted sail and seamanship training for the Corps of Cadets, and the coaching/management of the competitive inter-collegiate and offshore sailing program. The branch maintains over 130 boats of eight different classes that are used in the various programs, sports, and courses. It also identifies and prioritizes work projects that affect the piers and buildings along the waterfront.

**The Professional Maritime Studies Branch** is located in Yeaton Hall. A four-year Navigation and Nautical Science curriculum is delivered by the Branch. In



## *Catalog of Courses*

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addition to providing theory and application in the classroom, the material for these three and four credit courses is reinforced with hands on labs in Yeaton Hall and at the waterfront. The Professional Maritime Studies Branch also serves as the facility manager for the Ship Control and Navigation Training System (SCANTS), which includes several advanced shipboard simulators.

## *ATHLETICS DIVISION*



*Visitor's Center, Roland Field House, Billard Gym*

Many factors contribute to development of leaders of character. Not only does the Coast Guard Academy maintain responsibility for the intellectual and professional development of cadets, but it is also devoted to each cadet's physical development and wellness. This is accomplished through physical education classes, athletic activities during the sports period, and an institutional commitment to physical fitness. The physical education program emphasizes professional competencies and lifetime fitness and wellness.

The intercollegiate sports program is one of the broadest in NCAA Division III Athletics with eleven men's, nine women's and three coeducational varsity sports. The intercompany and club sports program is very active and cadet driven. All cadets are required to participate in these activities, which provide multiple opportunities for personal and professional development. The Athletics Division is overseen by the Director of Athletics.

## CADET SUPPORT SERVICES



*Coast Guard Memorial Chapel and Officers Row*

To foster the welfare and success of Cadets, numerous services are provided by way of academic assistance, personal and professional counseling, religious activities, and administrative support.

### ***Academic Support Services***

An essential goal of life in an academic community is the promotion of lifelong habits of learning. The Academic Support Services Program contributes to the creation and sustainment of an academic environment that encourages risk-taking, intellectual exploration, skill development, and innovative and critical thinking.

The following programs are provided under the Academic Support Services umbrella:

**Academic Advising Program** is a developmental system designed to prepare cadets to make sound decisions and to set their own priorities. For the fourth class, the program is more proactive than for other year groups. Fourth class cadets must meet with their academic advisors every two weeks. As cadets progress through their four years at the USCGA, they take increasing responsibility for their own academic success. Advisors provide assistance to all cadets and help them develop study skills, set priorities, and obtain information on career opportunities. Additionally, academic advisors approve cadets' course registrations, class schedule changes, and course adds and drops. It should be emphasized that, even though an individual faculty member may be assigned as an advisor, and therefore, is responsible for approving registration forms and other official paperwork, cadets are free to consult with any faculty member. The faculty and staff are

## *Catalog of Courses*

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deeply concerned for the welfare and success of each cadet, and they will generously give their time to any cadet who has a sincere desire to improve and succeed.

**Academic Center for Excellence (ACE)**, located on the second deck of the library in Waesche Hall, houses the Cadet Writing and Reading Center (CWRC). Professional tutors in the CWRC provide assistance to cadets who seek to improve their communication abilities. Specific assistance for provided for writing includes selecting and narrowing topics, composing effective thesis statements, understanding audience and purpose, selecting evidence, organizing and connecting ideas, developing coherent paragraphs, and applying grammatical principles. Reading assistance which is provided includes developing strategies to conduct effective research, how to read effectively in each discipline, building an effective general or discipline-specific vocabulary, and addressing language issues for international cadets. CWRC tutors also help cadets with oral presentations. The CWRC is open Sunday through Thursday evenings and during most business hours. Cadets can make an appointment in advance via TutorTrac or receive help on a walk-in basis. The staff is composed of members of the Coast Guard Academy faculty and civilians who are professional writers and educators. Established in 1987, the CWRC operates, in part, from funds provided by the John and Erna Hewitt Endowment.

**Cadet Academic Advisory Board (CAAB)** provides a direct channel of communication between the corps of cadets and the Dean of Academics. A standing council which is comprised of cadets from each class who have volunteered to serve on the board, due to their interest in creating a positive academic environment, CAAB members (during scheduled meetings) present to the Dean of Academics cadets' views on a wide range of topics related to the enhancement of their overall academic experience at the USCGA. The CAAB operates under the auspices of a faculty advisor who is assisted by the Charlie Company Academics Officer—the Chair of the CAAB. Depending upon the circumstances, the Chair of the CAAB may also be invited to participate in meetings held by the USCGA's Academic Council.

**Cadet Academic Assistance Program (CAAP)** provides discipline-specific evening workshops. The faculty, both civilian and military, support the Fourth Class Experience Course (known on campus as BEARS: Basic Essentials for Academic and Real-world Success) by serving as subject matter experts and resource persons for the improvement of cadets' study skills.

**Early Warning System** is a system that periodically, throughout the academic year, provides timely information to faculty and academic advisors concerning the academic performance of fourth class cadets.

**Four-Five-Two (4-5-2) Program** supports fourth class cadets whose SWAB

## *U. S. Coast Guard Academy*

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Summer placement scores indicate they would benefit from assistance in the fundamentals of mathematics, English, and reading in order to succeed in CGA's demanding academic program. Support includes a one-course reduction in the fall semester, during which cadets have specific time designated to work with faculty and tutors. Cadets review course topics as a class; work individually and in small groups; and apply concepts, especially time management, self-assessment, and study skills, from the Fourth Class Experience Course, known on campus as BEARS: Basic Essentials for Academic and Real-world Success. Program participants then take five classes during the spring semester and two classes during the summer before their third class year.

**Fourth Class (4/c) Course Coordinators' Committee** includes coordinators for 4/c core courses across departments who meet monthly to discuss academic, military, and athletic concerns unique to 4/c. The committee also includes representatives from the cadet and athletic divisions as well as the registrar's office. An advisory body to the Dean of Academics, the committee's main purposes are to discuss issues and to collaborate on the 4/c fall and spring exam schedules with focus on cadets' success in the first-year. The chairperson acts as the liaison between the committee and the Dean of Academics to ensure lines of communication remain open to better serve 4/c in their adjustment year at the Academy.

**Fourth Class (4/c) Experience Course (BEARS: Basic Essentials for Academic and Real-world Success)** is designed to aid fourth class cadets in making the transition from high school to college. In addition to helping develop useful study skills, the orientation course encourages cadets to "expand their personal horizons" through participation in self-selected activities and workshops and is the place where the conversation about lifelong learning begins.

**Honors Program** augments the regular curriculum and provides special opportunities for cadets who wish to broaden and enrich their academic experiences. Included in the program are several honors classes offered in specific academic disciplines; the Honors Colloquium, which prepares cadets to compete for such prestigious postgraduate fellowships and scholarships as the Rhodes, Fulbright, Truman, and Marshall ; and Alpha Lambda Delta, the national honor society for first-year college students.

**Instructional Support Program** provides a variety of services to help cadets use computers more productively. Services include training and access to a multimedia center which affords cadets the capability to create high-quality programs and presentations.

**International Cadet Council (ICC)** engages in various activities and meet-

## *Catalog of Courses*

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ings in support of its cultural, social and educational mission. The most important activities include: an annual visit to the United Nations and/or Pentagon, the Royal Military College of Canada, Naval War College, and participation in the United States Naval Academy (USNA) International Ball. Through counseling, identification of host families, assessment of cadets' language skills, development of individualized academic programs, and accessibility during cadet emergencies, the coordinator of the ICC facilitates the assimilation of international cadets into the corps of cadets.

**Learning and Study Strategies Inventory (LASSI) Modules** are a set of self-paced, purposeful, learning activities designed to strengthen cadets' academic performance by helping them to become strategic learners. Following the administration of the LASSI, a 10-scale, 80-item assessment of students' awareness about and use of learning and study strategies related to skill, personal will, and self-regulation components of strategic learning, on-line modules are made accessible to cadets in all ten scale areas: attitude, motivation, time management, anxiety, concentration, information processing, selecting main ideas, study aids, self-testing, and test strategies. Cadets' will be required to complete the modules for any LASSI area in which a percentile score of at least 75 is not attained.

**Peer Tutor Program** is comprised of cadet volunteers who have performed well in particular academic subjects. This program not only facilitates the academic success of students who request assistance but also helps the tutor-cadets improve their teaching and leadership skills. Peer tutors are available for most core-courses including but not limited to Chemistry I and II, Calculus I and II, Nautical Science I, Physics, Probability and Statistics, English Composition and Speech, Writing About Literature, Differential Equations, Statics and Engineering Design, Leaders in U.S. History, Physics I and II, Mechanics of Materials, Multivariable Calculus, Economics, and Morals and Ethics. A list of current peer tutors is posted each semester on the Corps of Cadets' Regimental Staff home page and on the peer tutor site located under Academic Resources in the Academic Division on the Academy's Portal. Additionally, rooms in Chase Hall that are occupied by peer tutors can be identified by the fluorescent orange name plates that appear outside the tutors' room. For further information regarding the peer tutoring program, please contact the Associate Dean for Academic Support Services at (860) 444-8608 or visit Room 131 in Hamilton Hall.

**SmarThinking**, a web-based computer application, provides cadets with access to highly qualified and well-trained professional educators twenty-four hours per day, seven days per week in a variety of subjects during the academic year via online tutoring using the Internet. For more information, go to: <http://www.smarthinking.com/>

**TutorTrac**, a web-based computer application affords cadets—twenty-four hours per day—the opportunity to schedule appointments to receive assistance in the USCGA’s Cadet Writing and Reading Center.

Guide to Officer and Leader Development (GOLD)

**The Guide to Officer and Leader Development (GOLD)** is a 200-week conceptual framework that challenges each cadet to develop as a leader of character. The GOLD construct is grounded in educational, psychological, and sociological research, and incorporates the Mission of the U.S. Coast Guard Academy (USCGA).

GOLD takes a comprehensive approach to developing high school graduates who enter the Academy’s gates. The Guide articulates a process of officer and leader development in which transformation can occur by recognizing sequential stages of human and military development. From the first steps of the Swabs through the arches at Chase Hall, to the commissioning oath at graduation, GOLD provides a standardized framework for cadet growth and an approach to leader development that is systematic, yet takes into account individual differences.

The USCGA has always produced excellent leaders of character. However, the world has changed profoundly in recent years. The Coast Guard’s missions have expanded. The operational environment in which recently graduated ensigns must execute their skills has become significantly more complex and increasingly dangerous.

As a result of GOLD, today’s graduates are more aware of the developmental processes inherent to maturity and the power of goal-setting in achieving success. With the assistance of classmates, faculty, and staff, cadets identify goals for growth and measure their progress within the five developmental domains: Physical, Professional, Intrinsic Values, Intellectual, and Civic. These efforts enable cadets to reach beyond their current abilities and attain their greatest potential.

### ***Center for Counseling and Development***

Counselors at the center are licensed psychologists. They are readily available to meet with any student at the Academy experiencing personal, educational, vocational, military, or leadership issues.

Personal counseling sessions may address a variety of topics including: stress management, interpersonal relationships, depression, anxiety, family problems, eating concerns, sexual assault, loneliness, self-esteem, motivation, academic difficulties, study skills, and career choices. Structured group workshops are held as requested on such topics as relaxation, stress management, healthy eating, sexual assault prevention, test anxiety, and study skills.

Psychological testing and evaluation are also available to help identify personality traits, learning and attentional problems, and vocational interests.

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Counseling services are strictly confidential and do not become part of a cadet's medical, academic, or military record.

### *The Command Religious Program*

In the military environment in which Cadets live, the Superintendent is responsible for the total well-being of all the members. This includes their moral, spiritual, and religious welfare. The Superintendent exercises this responsibility through the Command Religious Program. This program provides for the free exercise of all religious faiths, represented in the Command. Chaplains provide a wide range of religious services on traditional worship days during the weekends, on Wednesday evenings during SWAB summer and during the Academic Year, as well as at traditional festive seasons when the Corps of Cadets is aboard. If the Chaplains assigned to the Coast Guard Academy are not able to provide for a particular Faith Group represented in the Command, they seek the assistance of Navy Chaplains located at Submarine Base New London, or of the local clergy. The "Volunteer Religious Network," a group of lay-led local and national religious organizations also work with the Chaplains to provide further support.

## *LIBRARY*



*Waesche Hall*

The library occupies approximately 32,500 square feet in Waesche Hall, a three-story building on the north side of campus, which opened in 1974. The building is shared with the Coast Guard Museum, the Admissions Office, and the Cadet Reading and Writing Center. A wireless network is available throughout the library. All cadets are required to purchase a laptop with a standard configuration, ensuring universal access to productivity software and online library resources from anywhere on campus. Furniture arrangements are designed so that cadets, with or without laptops, have flexible space for individual or group work. In 2007, the library had 159 carrels/tables, 26 "soft" seats, and 69 other seats. Additionally, the library provides 5 public workstations, 2 workstations connected to the military network, a networked laser printer, a photocopier, and a scanner. The library is open 103.5 hours per week. A Cadet Watch is assigned to oversee building security on evenings and weekends. The library website, accessible through the campus intranet, provides 24/7 access to the local and consortium catalogs and databases, and is the primary means of delivering services and library information. The site also includes a number of subject and course research guides, and links to



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brief tutorials. A 24/7 chat reference service, provided through an outside contract and linked from the library website, is available to cadets when librarians are not on duty. The library maintains its own site in the Blackboard course management system and offers assistance to faculty with linking to library resources from their course sites.

Permanent collections include nearly 178,000 print and audiovisual items. Subscription access is provided to more than 55,000 periodicals. Just under 450 of these are print subscriptions while the remainder are provided through full-text databases.

Subject areas of emphasis include electrical engineering, civil engineering (including environmental engineering, mechanical engineering, marine architecture and naval engineering), marine sciences and environmental studies, operations research, leadership and management studies, American government, and since September 11, 2001, intelligence and terrorism studies. The CGA Library also continues to build its leadership collections, to support the Leadership Development Center based at the Academy, as well as the professional military studies curriculum.

The library provides orientation to all cadets during their first year at the Academy. A 45-minute library orientation is provided during Swab Summer, when cadets are undergoing basic training prior to the start of their Fourth Class (freshman) year. During the first semester, all new cadets enroll in a “first year experience” course, which is intended to develop the basic academic skills required for college success. This course includes a library component which is taught by the designated faculty member for each section. A library workbook is also assigned, which provides hands-on experience with the use of the library website, the library catalog, databases, and basic information literacy.

The G. William Miller Reading Room, complete with a book swap, popular magazines, games, and daily newspapers is a popular place for study in the library. The CGA Alumni Association provides funding for a self-service Tassimo coffee machine as well as an ongoing supply of coffee, hot chocolate, cappuccino, and tea. Snacks and soda are available from vending machines.

### ***REGISTRAR***

The Registrar is responsible for the development of the master schedule of courses for each semester, the enrollment of cadets in classes and the generation of all academic reports which relate to cadet academic records. The Registrar is also responsible for the compilation, evaluation, safe retention, and appropriate use of cadet academic records, the preparation and issuance of transcripts, and certification of selected data from the records.

Additional responsibilities of the Registrar publishing a Catalog of Courses and to maintain an electronic version that is accessible via the Internet. It lists courses of study offered for that academic year and each course’s description, credit value, format and projected offering. It also includes the appropriate policies, procedures and other information deemed appropriate by the Dean and the Registrar.



## **PART III — EDUCATION PROGRAMS**

Academic programs leading to a Bachelor of Science Degree are designed to provide Cadets with opportunities to major in one of eight disciplines that combine rigorous academic work and teamwork and leadership experiences that are relevant to a Coast Guard career and possible postgraduate work. The majors supplement a solid core academic program in engineering, science, mathematics, management, and the humanities, combined with unique curricula requirements in health and physical education and nautical science.

### ***ACADEMICS***

Cadet academic work is guided by an historically proven philosophy, carefully selected objectives, endorsed Shared Learning Outcomes, and multifaceted academic, training and leadership experiences, leading to an opportunity for a successful career in the Coast Guard.

### ***PHILOSOPHY OF EDUCATION***

With a foundation in both technology and the liberal arts, the Coast Guard Academy provides a challenging outcomes-oriented curriculum focused on active student learning. Our goal is to produce successful Coast Guard Officers and to engender an appreciation and habit for life-long learning. A focus on teamwork, leadership, commitment to service, and ethical practice informs the development of the Academy's curriculum.

The Coast Guard Academy is committed to the idea of a core curriculum, a common academic experience that provides a broad intellectual perspective. The breadth of a core curriculum encourages awareness of discipline interdependence and the limits of individual specialties. The Coast Guard Academy also believes that majoring in a specific discipline, one that has relevance to current and future Coast Guard missions, is a critical component of the academic program. Specialization encourages intellectual rigor and sophistication.

The framework and heritage for the educational program is a military tradition of leadership and excellence and a commitment to continuous quality improvement. No single teaching method or forum is given precedence. The educational experience at the Coast Guard Academy focuses on critical inquiry. Academic work is collaborative, a joint effort of faculty and students, experiential, interactive, and exciting.

Although we cannot know the future, we prepare students with a curriculum steeped in global history, as well as the history and tradition of service. Our challenge is to prepare cadets to take their place in a complex, changing, and shrinking global community in a creative manner that enhances the ability of the Coast Guard to fulfill its obligation to the nation.

## ***HONOR CONCEPT***

Cadets are expected to conduct themselves in accordance with an Honor Concept, which requires that “Cadets neither lie, cheat, steal, nor attempt to deceive.” Each individual must integrate this concept into his or her way of life so that it becomes the foundation on which to base interactions with all persons, both in the Coast Guard and in society in general.

The Honor Concept establishes an atmosphere of mutual trust and integrity within both the Corps of Cadets and the Coast Guard Officer Corps. It is essential that proper relationships among Coast Guard personnel are established at the earliest point in time, and for this reason the Corps of Cadets must be guided by the Concept:

### **“CADETS REVER HONOR”**

The Honor Concept is so fundamental to the qualifications of an individual aspiring to be an officer in the Coast Guard that a failure to adhere to its tenets is considered to be a major deficiency in a person’s suitability for commissioning. For this reason, breaches of the Honor Concept are considered to be serious offenses that normally result in disenrollment from the Academy.

## ***POLICIES AND PROCEDURES***

Smooth operation of academic activities is facilitated by the establishment of critical policies, procedures and standards that provide for a smooth and coherent administration of the cadet academic environment.

## ***ACCEPTANCE INTO A MAJOR***

Selecting a major is critical for academic success at the Academy.

***Fourth Class Cadets*** are assigned a Fourth Class academic advisor whose role is to assist them in becoming successful academic learners. Departmental presentations regarding the pedagogical content of each major and resulting career opportunities are made to cadets in the spring semester of their 4/c year. Cadets then select a major and work with an academic advisor to help them prepare a plan of study and to register for 3/c courses.

***Third Class Cadets*** must apply for and be formally accepted into a major before the start of their 2/c academic year. The common criterion for acceptance into any of the majors is the attainment of a 2.00 average in the set of courses identified as prerequisites for each major. In addition, some majors may demand minimum acceptable grades in certain courses or satisfactory completion of qualifying projects or examinations. Cadets who fail to gain departmental acceptance into their chosen academic major may be granted provisional acceptance by the Dean in consultation with Department Heads, with a specific plan for meeting the academic requirements of the major. A cadet who ultimately fails to gain acceptance to any academic major will be disenrolled.

### ***COURSE SUBSTITUTIONS***

Department Heads, in consultation with their faculty, may accept substitutes for required courses for acceptance into their major, if, in their judgment, the alternatives provide evidence of ability to succeed in the major. When a cadet is accepted into a major without having satisfied the prerequisites or their authorized substitutes, the Department Head shall notify the Dean and Registrar in writing of the conditions waived and the rationale for the acceptance.

Course substitutions for major-specific course requirements may be made only when authorized for a specific major or when specifically approved by the major coordinator and Department Head. One course may not be used to satisfy two separate course requirements.

### ***ACADEMIC STANDING***

Cadets are expected to make normal progress toward meeting the requirements for graduation in four years. The performance guidelines described below are designed to identify cadets who are not making the minimal progress required and to help them in obtaining the prompt assistance of their academic advisors and other members of the faculty and staff.

### ***ACADEMIC PERFORMANCE REVIEW***

As part of the normal advising process, each cadet's academic record is reviewed by the academic advisor at the end of each semester to assess the level of performance and to identify any potential problems. The Dean of Academics reviews the academic record of all cadets who fail to obtain a 2.00 Term or Cumulative Grade Point Average or who fail required courses. The Dean also reviews those cadets on extended opportunity and any cadet in danger of not meeting graduation requirements. Possible actions resulting from this review include placing the cadet on academic probation, scheduling an interview with the Cadet's GOLD Advisory Team or the Dean, recommending a change of major, or referring the cadet to the Academic Review Board. If the Dean believes that a cadet is in a position from which recovery is not possible, he or she will be referred to the Superintendent with a recommendation for disenrollment or extended opportunity.

### ***PERFORMANCE GUIDELINES***

1. Any cadet who receives two Fs in one semester or accumulates a total of three Fs is automatically placed on academic probation.
2. Any 4/c cadet who receives three Fs in the fall semester or four Fs for the year will be referred to the Superintendent with a recommendation for disenrollment.
3. Any cadet (other than 4/c) who accumulates a total of four or more Fs will be referred to the Superintendent with a recommendation for disenrollment.

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***Good Standing:*** A cadet whose academic performance indicates that he or she will fulfill all of the graduation requirements on schedule is said to be in Good Standing.

***Academic Probation:*** A cadet who is placed on Academic Probation is subject to restrictions imposed by the Dean of Academics and the Commandant of Cadets. These will include, but are not necessarily limited to, a schedule of mandatory consultations with the academic advisor. Each individual case will be reviewed to determine if restrictions should be placed on participation in sports or extracurricular activities. Academic Probationary status normally continues until graduation. However, a cadet on Academic Probation who earns a term average of 2.50 or greater for one semester or a 2.00 or greater for two successive semesters may petition the Dean of Academics to be removed from academic probationary status provided that their cumulative GPA is 2.00 or greater. Additional details on procedures for petitioning for removal from Academic Probation are found in the Regulations of the Corps of Cadets.

***Extended Opportunity:*** When exceptional circumstances exist, the Superintendent may elect to offer a cadet an opportunity to extend beyond the customary four-year course of study in lieu of disenrollment. Such cadets are normally registered for reduced course loads as directed by the Dean of Academics. Under no circumstances, however, may a cadet carry less than 12 credits without the express permission of the Dean of Academics. Cadets on extended opportunity are automatically placed on Academic Probation and they will be reviewed each semester they remain at the Academy.

***Disenrollment:*** A cadet who is disenrolled from the Academy is separated permanently, unless he or she subsequently applies and is accepted for readmission. In the case of readmission with or without advanced standing, all courses taken previously are included in computations of the cumulative grade point average. For the purpose of determining eligibility for Academic Probation or disenrollment, however, any Fs received prior to the readmission are excluded. A cadet who wishes to appeal the Superintendent's disenrollment decision must prepare a formal request in accordance with the Regulations for the Corps of Cadets and must forward it via the Chain of Command.

### ***REGISTRATION FOR COURSES***

During the spring semester cadets register for the courses they wish to complete during the next academic year. Course offerings and specific instructions are distributed in advance by the Registrar's Office. The Registrar will administer registration of 4/c cadets for fall and spring semester courses. Individual course assignments will consider major preferences, Advanced Placement Test results, mathematics and English placement testing completed during the summer, and departmental evaluation of academic work previously completed at other colleges and universities.

***Honors Courses:*** Cadets desiring to take an honors level course should contact the department head for further information. Honors courses may be substituted

## *Catalog of Courses*

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for the core course requirements.

***Directed Studies Courses:*** Cadets desiring to pursue study of an area beyond available courses may select a departmental Directed Studies course. These may be substituted for any major requirement with the approval of the designated department coordinator. The Registrar must be informed in writing of all authorized substitutions.

***Academy Scholars Program:*** The Academy Scholars Program offers a special intellectual challenge to cadets who have demonstrated outstanding scholastic abilities in the first class year. Those selected are given special recognition and academic privileges that enable them to pursue individually selected projects and special research under faculty guidance.

***Connecticut College Exchange Program:*** Full-time students at Connecticut College and the U.S. Coast Guard Academy may enroll in and receive credit for courses completed at the other institution. To qualify for this program, cadets must have: (1) valid academic reason for taking a course that is not available at the Academy and (2) approval of their academic advisor and the Dean of Academics. Enrollment in this program is normally limited to 1/c cadets who have demonstrated strong academic achievement.

***Academic Overloads:*** A 3/c, 2/c, or 1/c cadet in good academic standing may petition their Department Head to overload to carry more than five academic courses of 3 or more credits. To petition, the cadet must submit a memo to the Department Head via their Academic Advisor. If approved, a copy of the memo is sent to the Registrar. Cadets on Academic Probation or Extended Opportunity wishing to overload or cadets requiring an overload to meet graduation requirements must obtain approval by the Dean. These cadets must route a memo requesting the overload to the Dean via the Academic Advisor and Department Head. If the Dean approves the overload, action copies are sent to the Registrar and the Director of Academic Advising. All overload memos must be submitted prior to the beginning of the semester for which the overload will take place.

## ***CLASSES AND GRADING***

***Course Completion:*** Cadets who withdraw from an overload course or resign prior to 1600 hours on Study and Conference Day will be assigned a “W” for the dropped course or for all courses in the event of a resignation prior to the beginning of final exams. Cadets must complete the published course requirements, including scheduled final exams, for all remaining courses.

***Class Attendance:*** Section lists containing the names of cadets officially assigned to the courses and sections are distributed to the faculty at the beginning of each semester via the Registrar’s web site. Cadets are required to attend the specific lectures, laboratories, tests and review sessions to which they have been assigned. Cadets must inform instructors in advance of any authorized absences.

***Grading System:*** The unit of credit is the semester hour. One semester hour equals 50 minutes of lecture or 150 minutes of laboratory per week. The faculty member assigned to each course/section is responsible for evaluation of student

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course work and ultimately for accurate grade assignment and timely submission.

The following grades may be assigned as appropriate:

<i>Grade</i>	<i>Quality Points</i>	<i>Description</i>
H	4.00	Honors Quality
A	4.00	Excellent Quality
A-	3.70	Extremely Good Quality
B+	3.30	Very Good Quality
B	3.00	Good Quality
B-	2.70	Highly Satisfactory Quality
C+	2.30	Very Satisfactory Quality
C	2.00	Satisfactory Quality
C-	1.70	Barely Satisfactory Quality
D	1.00	Barely Passing
F	0.00	Failure of Course
I	0.00	Incomplete
W	0.00	Withdrawal from Course
Z	0.00	Audit of Course
V	0.00	Validation Credit
S	0.00	Satisfactory
U	0.00	Unsatisfactory

***Academic Averages:*** All courses taken at the Coast Guard Academy at any time for academic credit are counted toward the term (TGPA) and cumulative grade point averages (CGPA). Each average is determined by dividing the term or cumulative quality point total by the number of term or cumulative semester hours. Quality point totals are derived by multiplying the credit hours assigned to each course by the number of quality points associated with the grade assigned by the instructor. Courses validated, or transferred from another institution, are listed on the transcript, but they are not included in computations of grade point averages.

### ***ACADEMIC AND MILITARY RECOGNITION***

Several honors have been established to recognize academic and military excellence within the Corps.

The ***Board of Trustees List*** recognizes cadets with superior performance in all three areas of the Academy military, physical, and academic excellence. Cadets making this list are recognized through a ceremony hosted by the Board of Trustees members.

The ***Superintendent's List*** recognizes cadets named to both the Dean's List and the Commandant of Cadets' List.

The ***Dean's List*** identifies cadets who achieve at least a 3.15 TGPA while taking at least a normal course load of five academic courses and have no course grade less than a C in any course weighted more than one credit.

Cadets who earn a minimum Military Precedence Index as prescribed by the

## *Catalog of Courses*

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Commandant of Cadets may qualify for the *Commandant of Cadets' List*. Final listings will be based on Company Officer recommendations, and no more than 25% of each class will be named to this list. Cadets are not eligible if they are found in violation of a Class I offense of Cadet Regulations adjudicated during the term or receive a mark of less than 4 on any element of the cadet evaluation.

The *Military Precedence Average* (MPA) determines the military precedence within the class and the order in which a cadet's name will be placed on the Active Duty Promotion List in the Coast Guard Register of Officers after commissioning. The MPA is calculated using the cadet's Cumulative Grade Point Average (CGPA), Cumulative Military Precedence Index (CMPI), and the Cumulative Physical Development Competencies (CPDC) as follows:  $MPA = .70(CGPA) + .25(CMPI) + .05(CPDC)$ .

The *Athletic Director's List* recognizes those Cadets who earn honors on the semester physical fitness examination (PFE).

The *Regimental Commander's List* recognizes cadets who have increased their TGPA by at least 0.50 over the previous semester's TGPA and have not failed any course. Their TGPA must be at least 2.00 but less than 3.15 (which would qualify them for the Dean's List).

***Honors at Graduation:*** In recognition of high scholastic achievement, the Academy, upon recommendation of the faculty, awards the Bachelor of Science Degree with the following distinctions: High Honors for those who have earned a CGPA of 3.50 or higher; Honors for those earning a CGPA between 3.15 and 3.49. The Distinguished Graduate designation recognizes the cadet who graduates with the highest Military Precedence List Average. The Honor Graduate designation recognizes the cadet who graduates with the highest Cumulative Grade Point Average.

## ***BACHELOR OF SCIENCE DEGREE***

Each major has specific academic requirements for acceptance to the major, standards for validating courses taken externally, in addition to the specific course requirements of the major. In addition, there are Distribution requirements that apply to all Majors, and overall requirements for graduating with a Bachelor of Science Degree.

### ***Degree and Graduation Requirements***

Degree and graduation requirements are officially published in the Regulations of the Corps of Cadets. These requirements for the degree of Bachelor of Science and a Commission as an Ensign in the United States Coast Guard are as follows:

- a. Pass or validate every course in the core curriculum.
- b. Pass at least 37 courses of 3.00 credits or greater.



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- c. Complete the academic requirements for one of the majors as specified in the official Catalog of Courses.
- d. Attain an average of at least a 2.00 in all required upper division courses in the major, as specified in the official Catalog of Courses. Under normal circumstances, these courses consist of those taken to fulfill major requirements after formal admission to the major.
- e. Attain a Cumulative Grade Point Average of at least a 2.00.
- f. Be in residence at the Academy for at least four academic years.
- g. Complete successfully all required portions of the physical education program including meeting minimum swimming and physical fitness standards.
- h. Meet all military performance standards, demonstrating all aspects of personal and professional development necessary to serve as Ensigns in the United States Coast Guard, unless a commission will not be offered due to a medical disqualification.
- i. International cadets must meet the same standards of personal and professional development as all other graduates, notwithstanding that they are not entitled to appointment in the U.S. Coast Guard.

The Superintendent confers the degree of Bachelor of Science on those cadets in good standing who have met these requirements or revisions published since matriculation.

### ***VALIDATIONS***

The validation procedure is a mechanism whereby cadets may request a course exemption, based on personal competency or academic work completed elsewhere. This procedure affords cadets the opportunity to enroll in additional courses that will further enrich their undergraduate education. Validated courses are not awarded credit hours or quality points, nor may they be used to satisfy the minimum semester course load requirement. Courses accepted for validation credit may not be taken at a subsequent time for academic credit.

### ***Validation Requirements***

The requirements to validate a course are exclusively governed by the Academic Department responsible for offering that course.

Some accomplishments that may lead to granting of validation credit provided they are acceptable to the Department are:

- a. Score of 4 or better on the CEEB Advanced Placement examinations; or
- b. Grade of C or better in an equivalent college course at an accredited college or university as evidenced by a college transcript; or



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- c. Grade of B or better in an Advanced Placement or college level course that has been certified by an accredited college or university as noted on the high school transcript.

In addition to the general guidelines, Department Heads may apply specific requirements unique to the department's academic courses that supersede requirement (a), (b), or (c). The following unique requirements have been established:

### ***Engineering Department Validation***

Cadets may validate courses offered by the Engineering Department if they have accomplished requirements (b) or (c) above and gained the written approvals of the Section Chief in charge of that course, and the Engineering Department Head. Cadets may be required to take an oral or written exam to demonstrate adequate proficiency of the course material.

### ***Humanities Department Validation***

Cadets may validate courses offered by the Department of Humanities only if they have taken an accredited college course with a transcript grade of B or better and passed an examination administered by the CGA course coordinator. English composition may NOT be validated. Cadets who have earned a score of 5 on an Advanced Placement Examination in literature, U.S. history, or American government must pass an examination administered by the course coordinator to be placed out of the core course into a more advanced class in the same discipline.

### ***Health and Physical Education Department Validation***

The purpose of course validation in the Health and Physical Education (HPE) Curriculum is to permit any cadet the opportunity to validate selected HPE courses based upon work completed elsewhere or his / her capacity to meet the skill and the academic criteria of a specific course. Validation examinations must be completed during the first week of the semester. All validations are to be conducted by the course instructors under the direction of the Department Head, and any changes shall be processed through the Registrar's Office in accordance with course Add/Drop procedures.

### ***Management Department Validation***

Cadets may validate courses offered by the Management Department if they have taken an accredited college course with a transcript grade of B or better, or if they have taken an equivalent AP high school course with a transcript grade of B or better and receive a score of 5 on the CEEB AP exam. Cadets may also be required to take an oral exam administered by the course coordinator to demonstrate adequate proficiency of the subject.

### ***Mathematics Department Validation***

Cadets may validate courses offered by the Mathematics Department if they demonstrate adequate proficiency on a comprehensive validation exam administered by the course coordinator or calculus placement program administrator. Written approval by the Mathematics Department Head is also required.

### ***Sciences Department Validation***

The validation criteria for Chemistry I and II is an AP test score of 5 or satisfactory performance on an American Chemical Society National Standardized Exam. Cadets who met either of these criteria validated BOTH Chemistry I and II.

The validation criteria used for Physics I is the attainment of a score of 4 or higher on the Physics C AP exam, or attain a grade of A in an equivalent College level course, or demonstrated proficiency on a Physics I validation exam. The validation criteria used for Physics II is very similar – the attainment of a score of 4 or higher on the Physics C AP exam, or attain a grade of A in an equivalent College level course, or demonstrated proficiency on a Physics II validation exam.

### ***DISTRIBUTION REQUIREMENTS***

Courses from the following programs, which satisfy broad academic and professional purposes, are integrated in each of the Majors (with substitutions to satisfy any unique program needs):

- Core curriculum
- Professional maritime studies program
- Special programs
- Health and physical education program

### ***MAJORS REQUIREMENTS***

To earn the degree of Bachelor of Science, cadets must successfully complete the academic requirements for one of the following majors:

- Civil Engineering
- Electrical Engineering
- Mechanical Engineering
- Naval Architecture and Marine Engineering
- Marine and Environmental Sciences
- Operations Research and Computer Analysis
- Management
- Government

Each major has specific course requirements, including the distribution courses, mandatory courses, area or related elective courses, designated course substitutions, and optionally, free elective courses.

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### ***SUMMER ACADEMIC TERM***

The Academy offers a single six-week summer academic term beginning approximately five weeks after the end of the spring semester. Enrollment is limited to the following:

- Cadets accepted into the four-five-two program
- Cadets enrolled in 3111 – Calculus I in their 4/c spring semester and have indicated a preference for a technical major
- Cadets who fail 3117 – Calculus II in their 4/c spring semester and have indicated a preference for a technical major Cadets will be registered for two academic classes during the summer term.

### ***APPLICABILITY***

The Academic Standards and Requirements defined in this Catalog apply in full to the Class of 2013, effective Fall 2009.

Any cadet who is either reverted or readmitted to the Academy is subject to the academic regulations that apply to the new class to which he or she is assigned. The Catalog also includes the appropriate policies, procedures and other information deemed appropriate by the Dean and the Registrar.



## PART IV - PROGRAMS OF STUDY

### *Core Curriculum - 23 Courses (Dean of Academics)*

<b>Core Curriculum Requirements</b>	<b>Credits</b>
1116 Statics and Engineering Design	3.00
1320 Introduction to Electrical and Computer Engineering	3.30
or	
1218 Electrical Engineering I	4.00
or	
1321 Electric Circuits and Machines	4.00
2111 English Composition and Speech	3.00
2123 Writing About Literature	3.00
2141 Leaders in U.S. History	3.00
2263 American Government	3.00
or	
2259 Principles of American Government	3.00
2391 Criminal Justice	3.00
2393 Moral and Ethical Philosophy	3.00
or	
2293 Moral, Ethical and Political Philosophy	3.00
2493 Maritime Law Enforcement	3.00
3111 Calculus I	4.00
3117 Calculus II	4.00
3213 Probability and Statistics	3.00
or	
3301 Advanced Engineering Mathematics	4.00
or	
3341 Probability Theory	3.00
or	
3343 Mathematical Statistics	3.00
5102 Chemistry I	4.00
5106 Chemistry II	4.00
5262 Physics I	4.00
5266 Physics II	4.00
5442 Atmospheric and Marine Sciences	3.00
or	
5238 Physical Oceanography	3.50
8115 Macroeconomic Principles	3.00
8211 Leadership and Organizational Behavior	3.00

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### ***Professional Maritime Studies Program***

#### ***(Dean and Commandant of Cadets)***

##### **Professional Maritime Studies Program - Core Requirements Credits**

6101	Fundamentals of Navigation	4.00
6201	Ships and Maritime Systems	3.00
6202	Applications in Navigation Lab	1.00
6301	The Maritime Watch Officer	4.00
6401	The Coast Guard Division Officer	4.00

### ***Health and Physical Education Program***

#### ***(Director of Athletics)***

The Service Academy Mission states: “To graduate young men and women with sound bodies, stout hearts, and alert minds.” The Academy’s health and physical education program is designed to ensure that cadets meet this “sound body and stout heart” criterion. To this end, the Athletics Division not only supports shared learning outcomes but also has developed its own set of specific outcomes. At the end of the four-year physical education program, graduates are expected to demonstrate their ability to:

- Maintain a personal fitness program that allows them to meet the physical demands required of Coast Guard officers; be capable of counseling others in the methods, concepts, and materials used in developing and maintaining a healthy lifestyle
- Function successfully in an aquatics environment; defend themselves and others; and provide emergency aid to those in need
- Set individual and team level goals for short and long term planning, and assess and analyze results
- Perform as a group member in achieving a common goal, and persist in an ethical and disciplined manner when faced with adverse conditions in striving to achieve the goal

Cadets are required to complete health or physical education courses each year as part of the total curriculum, and to maintain a high degree of general physical fitness. During their years at the Academy, cadets are provided with the program and facilities that will assist them in the development of their physical potential. In order to assess their physical development competencies, cadets must successfully complete all Physical Fitness Examination requirements each semester while at the Academy. Cadets are required to be active in co-curricular physical activities such as intercollegiate athletics or intramural or club sports each semester where they develop psychosocial and sport skills through their participation.

The Health and Physical Education (HPE) curriculum includes six semesters of required courses. For the first three years, the curriculum is focused on the devel-

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opment of professional competencies and fitness/wellness knowledge and skills. In the first class year, cadets choose from a variety of lifetime physical activities

Cadets must satisfactorily complete all core HPE courses before taking any elective physical education courses. As a graduation requirement, each cadet must earn a minimum of six (6) academic credits in HPE courses.

***Course Requirements***

<b>HPE Mandatory Core Courses</b>		<b>Credits</b>
4102	Principles of Fitness and Wellness I	1.00
4103	Personal Defense I	0.25
4111	Swimming I	0.25
4112	Principles of Fitness and Wellness II	1.00
4204	Lifetime Sports I: Racquetball	0.25
4214	Lifetime Sports II: Golf	0.25
4222	Professional Rescuer	2.00
4303	Personal Defense II: Maritime Law Enforcement Techniques	0.25
4304	Lifetime Sports III: Tennis	0.25

**First Class cadets select one (or more) of the following:**

4401	Water Safety Instructor	1.00
4403	Martial Arts	0.50
4404	Badminton	0.25
4405	Adventure Sports I: Rock Climbing	0.50
4407	Dance	0.50
4409	Horseback Riding	0.50
4411	Scuba Diving	0.50
4414	Advanced Golf	0.25
4415	Adventure Sports II	0.50
4421	Advanced Scuba Diving	0.50
4439	Theory of Coaching	1.00
4444	Indoor Recreational Sports	0.50
4459	Sport/Wellness Leader	0.50
4464	Strength and Conditioning	0.50
4499	Directed Studies in Health and Physical Education	0.50

## DEPARTMENTAL PROGRAMS

The following sections for each major include a statement about the major, and criteria for acceptance into the major, along with Course Requirements, and a sample eight-semester Program of Study.

### CIVIL ENGINEERING

Civil Engineering (CE) provides a solid background in mathematics and basic sciences applied toward the study and design of engineered systems. As a broad field encompassing many disciplines, Civil Engineering offers a challenging and fulfilling career to individuals with a wide variety of interests. Upper level courses in the major include study in structural analysis, geotechnical engineering, construction, water resources, and environmental engineering. The program emphasizes development of open-ended problem solving, team building skills, creativity, and communication ability. In the senior level capstone design course, students integrate what they have learned in the design of a Civil Engineering system. Most capstone projects involve work on Coast Guard related projects. Graduates of the major are well prepared to pursue a variety of career opportunities and graduate programs in and out of the Coast Guard. The program is accredited by the Engineering Accreditation Commission of ABET, Inc.

In addition to the common departmental program mission, program educational objectives and department outcomes, outcomes of the Civil Engineering Major include producing graduates who:

- have a broad base of knowledge in civil engineering represented by the structural, environmental, geotechnical, construction and civil engineering materials discipline areas,
- can perform fundamental laboratory procedures in civil engineering including the areas of geotechnical, environmental, materials and structures,
- can perform fundamental design procedures in civil engineering, including the areas of structural, environmental and geotechnical, and
- understand professional practice issues pertaining to construction management, ethics and professional licensure.

#### *Acceptance into the Major*

Acceptance requires attainment of a 2.00 average in all Mathematics, Science, and Engineering courses taken prior to the beginning of the 2/c year.

In addition, a grade of C or above in the following courses:

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- 1116 Statics and Engineering Design
- 1206 Mechanics of Materials

**I. Core Requirements:**

Substitute Electric Circuits and Machines (1321) for Introduction to Electrical and Computer Engineering (1320). Probability Theory (3341) or Advanced Engineering Mathematics (3301) may be substituted for Probability and Statistics (3213).

**II. Major Requirements:**

- |                               |                                |
|-------------------------------|--------------------------------|
| 1206 Mech of Materials        | 1211 Dynamics                  |
| 1302 Mat'ls Civil/Constr Engr | 1304 Soil Mech & Fndtn Design  |
| 1309 Environmental Engr I     | 1313 Steel Design              |
| 1317 Struct Analysis I        | 1340 Fluid Mechanics           |
| 1351 Thermodynamics           | 1401 Construction Project Mgmt |
| 1402 Civil Eng'ring Design    | 1404 Geotechnical Engr Design  |
| 1407 Environmental Engr II    | 1411 Reinf Concrete Design     |
| 3211 Multivariable Calculus   | 3215 Differential Equations    |

**III. Upper Division Courses:**

- |                                  |                               |
|----------------------------------|-------------------------------|
| 1302 Materials Civil/Constr Engr | 1304 Soil Mech & Fndtn Design |
| 1309 Environmental Engr I        | 1313 Steel Design             |
| 1317 Struct Analysis I           | 1321 Elec Cir & Machines      |
| 1340 Fluid Mechanics             | 1351 Thermodynamics           |
| 1401 Construction Project Mgmt   | 1402 Civil Engineering Design |
| 1411 Reinf Concrete Design       |                               |

**CIVIL ENGINEERING—GENERAL**

<b>Fall Semester</b>			<b>Spring Semester</b>		
<i>Fourth Class Year</i>	<i>Credits</i>		<i>Fourth Class Year</i>	<i>Credits</i>	
0901 Fourth Class Exp	1.00		2123 Writing About Literature	3.00	
1116 Statics & Engr Design	3.00		3117 Calculus II	4.00	
2111 Eng Comp & Speech	3.00		4103 Personal Defense I	0.25	
2141 Leaders in U.S. Hist	3.00		4112 Prin Fitness/Wellness II	1.00	
3111 Calculus I	4.00		5106 Chemistry II	4.00	
4102 Prin Fitness/Wellness I	1.00		6101 Fndamntls of Navigation	4.00	
4111 Swimming I	0.25		8115 Macroeconomic Prin	3.00	
5102 Chemistry I	4.00				
<i>Third Class Year</i>	<i>Credits</i>		<i>Third Class Year</i>	<i>Credits</i>	
1206 Mech of Materials	3.50		1211 Dynamics	3.00	
2263 American Government	3.00		3213 Probability & Statistics	3.00	
3211 Multivariable Calculus	3.00		3215 Differential Equations	3.00	
4222 Professional Rescuer	2.00		4204 Lifetime Sports I: RQB	0.25	



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5262	Physics I	4.00	4214	Lifetime Sports II: Golf	0.25
8211	Ldrship & Org Behavior	3.00	5266	Physics II	4.00
			6201	Ships & Maritime Sys	3.00
			6202	Apps in Navigation Lab	1.00

<i>Second Class Year</i>		<i>Credits</i>			<i>Credits</i>
1302	Mat'ls Civil/Constr Engr	4.00	1304	Soil Mech & Fndtn Dsgn	4.00
1309	Environmental Engr I	4.00	1313	Steel Design	3.00
1317	Struct Analysis I	3.00	1407	Environmental Engr II	3.00
1340	Fluid Mechanics	3.00	2391	Criminal Justice	3.00
4303	Personal Defense II	0.25	4304	Lifetime Sports III: Tennis	0.25
5442	Atmospherc & Mar Sci	3.00	6301	Maritime Watch Officer	4.00

<i>First Class Year</i>		<i>Credits</i>			<i>Credits</i>
1321	Elec Cir & Machines	4.00	1402	Civil Engr Design	4.00
1351	Thermodynamics	3.00	2393	Moral & Ethical Phil	3.00
1401	Const Proj Mgmt	3.00	2493	Maritime Law Enfrcmnt	3.00
1404	Geotechnical Engr Design	3.00	6401	Coast Guard Div Officer	4.00
1411	Reinf Concrete Dsgn	3.00	_____	Free Elective	3.00-4.00
_____	Physical Education	0.50	_____	Physical Education	See Note

Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

## **ELECTRICAL ENGINEERING**

The Electrical Engineering (EE) major is a sound undergraduate educational program that prepares future officers to be the leaders in developing and implementing new technologies in the Coast Guard. The student who completes this program will be thoroughly ready for professional practice and ready for a wide spectrum of postgraduate studies. Particular emphasis is placed on the analysis, design and applications of linear and digital systems. Major prescribed courses provide an integrated understanding of the core disciplines of electrical engineering. These include digital communications, signal processing, control systems, antennas, electrical machines, circuit design, and computer systems. Computers are used throughout the curriculum. In the capstone senior design course students creatively apply knowledge to solve challenging real-world problems, often working side by side with Coast Guard engineers on actual projects in the field. The program consists of a comprehensive foundation plus a student-selected emphasis in either Systems or Computers. The degree granted from either emphasis is the Bachelor of Science in Electrical Engineering. This program is accredited by the Engineering Accreditation Commission of ABET, Inc.

In addition to the common departmental program mission, program educational objectives and department outcomes, outcomes of the Electrical Engineering Major include producing graduates who have:

- knowledge of probability and statistics, including applications appropriate to Electrical Engineering
- knowledge of mathematics through differential and integral calculus, basic sciences, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components, as appropriate to program objectives
- knowledge of advanced mathematics, typically including differential equations, linear algebra, complex variables, and discrete mathematics
- competence in technical decision making

### ***Acceptance into the Major***

Acceptance requires attainment of a 2.00 average in all Mathematics, Science, and Engineering courses taken prior to the beginning of the 2/c year.

Grade of C or above in the following courses:

1218	Electrical Engineering I
1222	Signals, Systems, and Transforms
1224	Introduction to Computer Programming
1324	Digital Circuits and Computer Systems

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In addition a passing grade in the following courses:

- 3211 Multivariable Calculus
- 3215 Differential Equations

### I. Core Requirements:

Substitute Electrical Engineering I (1218) for Introduction to Electrical and Computer Engineering (1320). Substitute Probability Theory (3341) for Probability and Statistics (3213).

### II. Major Requirements:

<b>Computer Emphasis</b>	<b>Systems Emphasis</b>
1222 Signals, Systems & Trnsfrms	1222 Signals, Systems & Trnsfrms
1224 Intro to Comp Programming	1224 Intro to Comp Programming
1322 Linear Circuits	1322 Linear Circuits
1324 Digital Circ/Comp Systems	1324 Digital Circ/Comp Systems
1362 Software Design I	1326 Electromech Systems
1424 Computer Control Systems	1420 Antennas & Propagation
1426 Projects Elec/Comp Engr I	1422 Communication Systems
1429 Digital Signal Process	1424 Computer Control Systems
1432 Computer Comms & Ntwrkng	1426 Projects Elec/Comp Engr I
1436 Projects Elec/Comp Engr II	1429 Digital Signal Process
1458 Software Design II	1436 Projects Elec/Comp Engr II
3211 Multivariable Calculus	3211 Multivariable Calculus
3215 Differential Equations	3215 Differential Equations
_____ Major Area Elective	_____ Major Area Elective
_____ Major Area Elective	_____ Major Area Elective
_____ Math/Science Elective	_____ Math/Science Elective

### III. Major Area Electives:

Major area Elective courses for the EE major are defined as Engineering courses, 200 level or higher, other than Introduction to Electrical and Computer Engineering (1320), Electric Circuits and Machines (1321), and Modeling and Control of Dynamic Systems (1460). In special cases (and with prior approval by the Electrical and Computer Engineering Section Chief), Directed Studies in Electrical Engineering (1439) may be considered a major area elective. Below is a list of common major area electives for each track.

<b>Computer Emphasis</b>	<b>Systems Emphasis</b>
1206 Mech of Materials	1206 Mech of Materials
1211 Dynamics	1211 Dynamics
1326 Electromech Systems	1327 Acoustics and Music
1327 Acoustics and Music	1340 Fluid Mechanics
1340 Fluid Mechanics	1351 Thermodynamics
1351 Thermodynamics	1362 Software Design I
1420 Antennas & Propagation	1431 Electronic Nav Systems

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1422	Communication Systems	1432	Computer Comms & Ntwks
1431	Electronic Nav Systems	1458	Software Design II

IV. Mathematics/Science Elective:

The purpose of the mathematics/Science Elective is to offer students the chance to add breath to their Electrical Engineering course of study. Students must choose one course from the following list:

3221	Linear Algebra	3237	Discrete Mathematics
3343	Mathematical Statistics	5364	Semiconductor Physics
5477	Optics		

V. Upper Division Courses:

For the purposes of USCGA graduation requirements, upper-division courses in the Electrical Engineering major are defined as those courses specified for the major that a cadet, following the published nominal program of study, would take during his/her 1/c and 2/c years. Each cadet must satisfy the graduation requirements with a set of courses that includes those courses required of all EE majors plus the courses required for one of the established areas of emphasis (tracks).

**For all Electrical Engineering Majors:**

- 1322 Linear Circuits
- 1424 Computer Control Systems
- 1426 Projects in Electrical and Computer Engineering I
- 1429 Digital Signal Processing
- 1436 Projects in Electrical and Computer Engineering II
- 3341 Probability Theory
- \_\_\_\_\_ Major Area Electives (2)
- \_\_\_\_\_ Mathematics/Science Elective

**Additionally for the Computer Emphasis:**

- 1362 Software Design I
- 1432 Computer Communications and Networking
- 1458 Software Design II

**Additionally for the Systems Emphasis:**

- 1326 Electromechanical Systems
- 1420 Antennas and Propagation
- 1422 Communication Systems

## Catalog of Courses

### ELECTRICAL ENGINEERING—COMPUTER EMPHASIS

<b>Fall Semester</b>			<b>Spring Semester</b>		
<i>Fourth Class Year</i>			<i>Credits</i>		
0901	Fourth Class Exp	1.00	2123	Writing About Literature	3.00
1116	Statics & Engr Dsgn	3.00	3117	Calculus II	4.00
2111	Eng Comp & Speech	3.00	4103	Personal Defense I	0.25
2141	Leaders in U.S. Hist	3.00	4112	Prin Fitness/Wellness II	1.00
3111	Calculus I	4.00	5106	Chemistry II	4.00
4102	Prin Fitness/Wellness I	1.00	6101	Fndamntls of Navigation	4.00
4111	Swimming I	0.25	8115	Macroeconomic Prin	3.00
5102	Chemistry I	4.00			
<i>Third Class Year</i>			<i>Credits</i>		
1218	Elec Engineering I	4.00	1222	Sgnls, Syst & Trnsfrms	4.00
1224	Intro to Comp Prog	3.00	1324	Digital Circ/Comp Syst	4.00
3215	Differential Equations	3.00	3211	Multivariable Calculus	3.00
4222	Professional Rescuer	2.00	4204	Lifetime Sports I: RQB	0.25
5262	Physics I	4.00	4214	Lifetime Sports II: Golf	0.25
6201	Ships & Maritime Sys	3.00	5266	Physics II	4.00
6202	Apps in Navigation Lab	1.00	8211	Ldrshp & Org Behavior	3.00
<i>Second Class Year</i>			<i>Credits</i>		
1322	Linear Circuits	4.00	1424	Computer Control Syst	3.50
1362	Software Design I	3.50	1429	Digital Signal Process	3.00
2391	Criminal Justice	3.00	1458	Software Design II	3.50
3341	Probability Theory	3.00	2263	American Government	3.00
4303	Personal Defense II	0.25	4304	Lifetime Sports III: Tennis	0.25
6301	Maritime Watch Officer	4.00	_____	Math/Science Elctive	3.00-3.50
<i>First Class Year</i>			<i>Credits</i>		
1426	Projects Elec/Comp Engr I	4.00	1432	Comptr Comms & Ntwks	4.00
2493	Maritime Law Enfrcmnt	3.00	1436	Projs Elec/Comp Engr II	4.00
5442	Atmospherc & Mar Sci	3.00	2393	Moral & Ethical Phil	3.00
_____	Major Area Elective	3.00-4.00	6401	Coast Guard Div Officer	4.00
_____	Major Area Elective	3.00-4.00	_____	Free Elective	3.00-4.00
_____	Physical Education	0.50	_____	Physical Education	See Note

Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

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**ELECTRICAL ENGINEERING—SYSTEMS EMPHASIS**

<b>Fall Semester</b>			<b>Spring Semester</b>		
<i>Fourth Class Year</i>			<i>Credits</i>		
0901	Fourth Class Exp	1.00	2123	Writing About Literature	3.00
1116	Statics & Engr Dsgn	3.00	3117	Calculus II	4.00
2111	Eng Comp & Speech	3.00	4103	Personal Defense I	0.25
2141	Leaders in U.S. Hist	3.00	4112	Prin Fitness/Wellness II	1.00
3111	Calculus I	4.00	5106	Chemistry II	4.00
4102	Prin Fitness/Wellness I	1.00	6101	Fndmntls of Navigation	4.00
4111	Swimming I	0.25	8115	Macroeconomic Prin	3.00
5102	Chemistry I	4.00			
<i>Third Class Year</i>			<i>Credits</i>		
1218	Elec Engineering I	4.00	1222	Sgnls, Syst & Trnsfrms	4.00
1224	Intro to Comp Prog	3.00	1324	Digital Circ/Comp Sys	4.00
3215	Differential Equations	3.00	3211	Multivariable Calculus	3.00
4222	Professional Rescuer	2.00	4204	Lifetime Sports I: RQB	0.25
5262	Physics I	4.00	4214	Lifetime Sports II: Golf	0.25
6201	Ships & Maritime Sys	3.00	5266	Physics II	4.00
6202	Apps in Navigation Lab	1.00	8211	Ldrshp & Org Behavior	3.00
<i>Second Class Year</i>			<i>Credits</i>		
1322	Linear Circuits	4.00	1424	Comptr Control Systems	3.50
1420	Antennas & Propagatn	4.00	1429	Digital Signal Process	3.00
2391	Criminal Justice	3.00	2263	American Government	3.00
3341	Probability Theory	3.00	4304	Lifetime Sports III: Tennis	0.25
4303	Personal Defense II	0.25	6301	Maritime Watch Officer	4.00
_____	Major Area Elective	3.00-4.00	_____	Math/Science Elect.	3.00-3.50
<i>First Class Year</i>			<i>Credits</i>		
1422	Communication Systems	4.00	1326	Electromech Systems	3.30
1426	Prjcts Elec/Comp Engr I	4.00	1436	Prjcts Elec/Comp Engr II	4.00
2493	Maritime Law Enfcmnt	3.00	2393	Moral & Ethical Phil	3.00
5442	Atmospherc & Mar Sci	3.00	6401	Coast Guard Div Officer	4.00
_____	Major Area Elective	3.00-4.00	_____	Free Elective	3.00-4.00
_____	Physical Education	0.50	_____	Physical Education	See Note

Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

## MECHANICAL ENGINEERING

The Mechanical Engineering (ME) major provides a solid foundation for service as a Coast Guard Officer, professional engineering practice, and further study in Mechanical Engineering or many other related fields. The major requirements develop the students' ability to apply scientific principles in the design and analysis of mechanical and energy conversion systems. Students are challenged with design problems in most of the major courses that provide opportunities for developing creativity solving real-world problems. The program culminates with a hands-on capstone design project where teams of students use their acquired knowledge to design, build, and test a practical device. This program is accredited by the Engineering Accreditation Commission of ABET, Inc.

In addition to the common departmental program mission, program educational objectives and department outcomes, outcomes of the Mechanical Engineering Major include producing graduates who have:

- knowledge of chemistry calculus-based physics with depth in at least one
- the ability to apply advanced mathematics through multivariate calculus and differential equations, familiarity with statistics and linear algebra
- the ability to work professionally in both thermal and mechanical systems areas including the design and realization of such systems.

### *Acceptance into the Major*

Acceptance requires attainment of a 2.00 average in all Mathematics, Science, and Engineering courses taken prior to the beginning of the 2/c year.

In addition, a grade of C or above in the following courses:

1116	Statics and Engineering Design
1206	Mechanics of Materials
1208	Introduction to Mechanical Engineering Design
1211	Dynamics

#### I. Core Requirements:

Substitute Electric Circuits and Machines (1321) for Introduction to Electrical and Computer Engineering (1320). Substitute Advanced Engineering Mathematics (3301) for Probability and Statistics (3213).

#### II. Major Requirements:

1204	Engr Material Science	1206	Mech of Materials
1208	Intr to Mech Engr Desgn	1211	Dynamics
1321	Elect Circuits & Machines	1340	Fluid Mechanics
1346	Experimental Methods	1351	Thermodynamics
1353	Thermal Systems Design	1370	Mechanisms

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1440	Machine Design	1446	Mechanical Engr Dsgn
1459	Heat Transfer	1460	Mod & Cntrl of Dyn Sys
3211	Multivariable Calculus	3215	Differential Equations
3301	Adv Engineering Math		

III. Upper Division Courses:

All 13XX and 14XX level courses in the Major are considered as Upper Division Courses.

**MECHANICAL ENGINEERING—GENERAL**

<b>Fall Semester</b>		<b>Spring Semester</b>	
<i>Fourth Class Year</i>		<i>Credits</i>	
0901	Fourth Class Exp	1.00	
1116	Statics & Engr Dsgn	3.00	
2111	Eng Comp & Speech	3.00	
2141	Leaders in U.S. Hist	3.00	
3111	Calculus I	4.00	
4102	Prin Fitness/Wellness I	1.00	
4111	Swimming I	0.25	
5102	Chemistry I	4.00	
			<i>Credits</i>
2123	Writing About Literature	3.00	
3117	Calculus II	4.00	
4103	Personal Defense I	0.25	
4112	Prin Fitness/Wellness II	1.00	
5106	Chemistry II	4.00	
6101	Fndamntls of Navigation	4.00	
8115	Macroeconomic Prin	3.00	
<i>Third Class Year</i>		<i>Credits</i>	
1206	Mech of Materials	3.50	
1208	Intro Mech Engr Design	3.00	
3211	Multivariable Calculus	3.00	
4222	Professional Rescuer	2.00	
5262	Physics I	4.00	
8211	Ldrshp & Org Behavior	3.00	
6202	Apps in Navigation Lab	1.00	
			<i>Credits</i>
1204	Engr Material Science	4.00	
1211	Dynamics	3.00	
3215	Differential Equations	3.00	
4204	Lifetime Sports I: RQB	0.25	
4214	Lifetime Sports II: Golf	0.25	
5266	Physics II	4.00	
6201	Ships & Maritime Sys	3.00	
<i>Second Class Year</i>		<i>Credits</i>	
1321	Elec Cir & Machines	4.00	
1340	Fluid Mechanics	3.00	
1351	Thermodynamics	3.00	
2393	Moral & Ethical Phil	3.00	
4303	Personal Defense II	0.25	
6301	Maritime Watch Officer	4.00	
			<i>Credits</i>
1353	Thermal Systems Design	3.00	
1370	Mechanisms	4.00	
1459	Heat Transfer	3.00	
2263	American Government	3.00	
3301	Adv Engineering Math	4.00	
4304	Lifetime Sports III: Tennis	0.25	
<i>First Class Year</i>		<i>Credits</i>	
1346	Experimental Methods	3.00	
1440	Machine Design	4.00	
1460	Mod & Cntrl of Dyn Syst	3.00	
2391	Criminal Justice	3.00	
_____	Free Elective	3.00-4.00	
			<i>Credits</i>
1446	Mech Engr Design	4.00	
2493	Maritime Law Enfrcmnt	3.00	
5442	Atmospherc & Mar Sci	3.00	
6401	Coast Guard Div Officer	4.00	
_____	Free Elective	3.00-4.00	



*Catalog of Courses*

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\_\_\_\_ Physical Education      0.50      \_\_\_\_ Physical Education    See Note

Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.



## **NAVAL ARCHITECTURE AND MARINE ENGINEERING**

The Naval Architecture and Marine Engineering (NA&ME) major provides a strong undergraduate educational program in engineering, mathematics and the sciences. Graduates from this program are well prepared for service as Coast Guard Officers in a wide spectrum of Coast Guard missions. This program provides a solid educational basis for professional engineering practice both in and outside of the Coast Guard, and affords the graduate considerable latitude for postgraduate study in Naval Architecture, Marine Engineering, Mechanical Engineering and other related fields. This program emphasizes the development of the student's ability to understand and apply engineering principles to the design and analysis of surface ships. Practical hands-on engineering applications blended with computer-aided design and analysis methods provide students with a coordinated mix of theoretical and practical engineering education.

Open-ended design projects are presented in most major courses to challenge students to creatively apply their understanding to the solution of real-world engineering problems. The senior capstone courses present the ultimate design challenge where teams of students develop and integrate a conceptual ship design. This effort involves the design and analysis of the ship's hull (form and structure), propulsion and auxiliary systems, general arrangements, crewing, cost studies, etc. This design-team-based year-long senior project is focused on meeting the specific needs of the Coast Guard and/or maritime industry. The major is accredited by the Engineering Accreditation Commission of ABET, Inc.

In addition to the common departmental program mission, program educational objectives, and department outcomes, outcomes of the Naval Architecture and Marine Engineering Major include producing graduates who have:

- the ability to apply probability and statistical methods to naval architecture and marine engineering problems
- basic knowledge of fluid mechanics, dynamics, structural mechanics, materials properties, hydrostatics, and energy-propulsion systems in the context of marine vehicles
- familiarity with instrumentation appropriate to naval architecture and-or marine engineering

### ***Acceptance into the Major***

Acceptance requires attainment of a 2.00 average in all Mathematics, Science, and Engineering courses taken prior to the beginning of the 2/c year.

In addition, a grade of C or above in the following courses:

1116	Statics and Engineering Design
1206	Mechanics of Materials

## *Catalog of Courses*

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### I. Core Requirements:

Substitute Electric Circuits and Machines (1321) for Introduction to Electrical and Computer Engineering (1320). Substitute Advanced Engineering Mathematics (3301) for Probability and Statistics (3213).

### II. Major Requirements:

1204	Engr Material Science	1206	Mech of Materials
1211	Dynamics	1321	Elec Cir & Machines
1340	Fluid Mechanics	1342	Prin of Naval Architecture
1346	Experimental Methods	1351	Thermodynamics
1353	Thermal Systems Design	1442	Prin of Ship Design
1444	Ship Design/Syst Intgr	1453	Ship Propulsion Design
1455	Ship Structures	1459	Heat Transfer
3211	Multivariable Calculus	3215	Differential Equations
3301	Adv Engineering Math	_____	Major Area Elective

### III. Major Area Electives:

The purpose of this elective is to offer students the opportunity to explore a wider variety of technical topics via a pre-existing course. Any Engineering, Math, or Science course (12XX, 32XX, 52XX or above, not already taken) qualifies as a major area elective.

Below is a common list of major area electives:

1208	Intro Mech Eng Design	1222	Sgnls, Syst & Trnsfrms
1224	Intro Comp Prog	1304	Soil Mechanics
1309	Environmental Eng I	1317	Structural Analysis I
1324	Digital Cir/Comp Syst	1326	Electromech Systems
1327	Acoustics and Music	1370	Mechanisms
1401	Construction Project Mgmt	1408	Surveying
1420	Antennas & Propagation	1431	Electronic Navigation Syst
1432	Computer Comms & Ntwks	1435	Intro Aerodynamics
1451	Introduction to Seakeeping	1460	Mech Cntrl of Dyn Syst
1462	Finite Element Analysis	1465	Detection of Rdioactive Mtrls
1469	Directed Studies in NA&ME	3221	Linear Algebra
3231	Linear Optimization	3237	Discrete Mathematics
3311	Advanced Calculus	3335	Visual Basic
3341	Probability Theory	3417	Numerical Analysis
3447	Linear Regression	5232	Marine Biology
5234	Marine Geochemistry	5240	Meteorology
5306	Physical Chemistry	5312	Analytical Methods/Chem
5364	Semi-conductor Phycs	5366	Astronomy
5402	Organic Chemistry	5415	Hazardous Materials
5417	Toxicology	5445	Fisheries Management
5477	Optics		

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Note: Courses specifically prohibited as major area electives include: 1218 Elec Engineering I, 1302 Materials for Civil and Construction Engineers, and 1320 Intro Elec/Comp Engineering.

IV. Upper Division Courses:

All 13XX and 14XX level courses in the Major, Advanced Engineering Math (3301), and the Major Area Elective are considered as Upper Division Courses.

**NAVAL ARCHITECTURE AND MARINE ENGINEERING—GENERAL**

<b>Fall Semester</b>		<b>Spring Semester</b>	
<i>Fourth Class Year</i>		<i>Credits</i>	
0901	Fourth Class Exp	1.00	2123 Writing About Literature
1116	Statics & Engr Design	3.00	3117 Calculus II
2111	Eng Comp & Speech	3.00	4103 Personal Defense I
2141	Leaders in U.S. Hist	3.00	4112 Prin Fitness/Wellness II
3111	Calculus I	4.00	5106 Chemistry II
4102	Prin Fitness/Wellness I	1.00	6101 Fndamntls of Navigation
4111	Swimming I	0.25	8115 Macroeconomic Prin
5102	Chemistry I	4.00	
<i>Third Class Year</i>		<i>Credits</i>	
1206	Mech of Materials	3.50	1204 Engr Material Science
3211	Multivariable Calculus	3.00	1211 Dynamics
4222	Professional Rescuer	2.00	2263 American Government
5262	Physics I	4.00	3215 Differential Equations
6201	Ships & Maritime Sys	3.00	4204 Lifetime Sports I: RQB
6202	Apps in Navigation Lab	1.00	4214 Lifetime Sports II: Golf
8211	Ldrshp & Org Behavior	3.00	5266 Physics II
<i>Second Class Year</i>		<i>Credits</i>	
1321	Elec Cir & Machines	4.00	1342 Prin of Naval Arch
1340	Fluid Mechanics	3.00	1353 Thermal Systems Dsgn
1351	Thermodynamics	3.00	1459 Heat Transfer
2393	Moral & Ethical Phil	3.00	2391 Criminal Justice
4303	Personal Defense II	0.25	3301 Adv Engineering Math
6301	Maritime Watch Officer	4.00	4304 Lifetime Sports III: Tennis
<i>First Class Year</i>		<i>Credits</i>	
1346	Experimental Methods	3.00	1444 Ship Dsgn/Syst Intgr
1442	Prin of Ship Design	4.00	2493 Maritime Law Enfrcmnt
1453	Ship Propulsion Design	3.00	5442 Atmospherc & Mar Sci
1455	Ship Structures	3.00	6401 Coast Guard Div Officer
_____	Major Area Elective	3.00-4.00	_____ Free Elective
_____	Physical Education	0.50	_____ Physical Education

## *Catalog of Courses*

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Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

## GOVERNMENT

The Government (GOVT) major develops leaders who think critically about political systems and understand their cultural, historical, theoretical, and jurisprudential underpinnings. The major offers two tracks for focused study in Public Policy or International Affairs, which acquaint students with how cultures, institutions, and political processes shape the domestic and international context in which individuals and states interact. To supplement these tracks, cadets may also take courses in law, strategic intelligence and Spanish. Additional study in history, philosophy, and literature provides cadets in the Government Major a broad educational experience. Advanced students may pursue research opportunities in specialties represented by over twenty faculty. Select students in the major may also pursue advanced research projects in policy related to Coast Guard and Department of Homeland Security initiatives. The Department is a member of the American Political Science Association and sponsors cadet membership in Pi Sigma Alpha, the National Political Science Honor Society.

### *Acceptance into the Major*

Acceptance requires attainment of a 2.00 average in the following courses:

- 2111 English Composition and Speech  
or 2121 The Art of Effective Writing
- 2123 Writing About Literature  
or 2125 Writing About Literature (Honors)
- 2141 Leaders in U.S. History
- 2263 American Government  
or 2259 Principles of American Government
- 2261 American Foreign Policy
- 2365 Comparative Politics
- 2293 Moral, Ethical and Political Philosophy

#### I. Core Requirements:

Government majors should take Principles of American Government (2259) instead of American Government (2263) and Moral, Ethical and Political Philosophy (2293) instead of Moral and Ethical Philosophy (2393).

#### II. Major Requirements:

- |      |                         |      |                                    |
|------|-------------------------|------|------------------------------------|
| 2261 | American Foreign Policy | 2323 | Hum in World Lit: Arts             |
| 2365 | Comparative Politics    |      | or 2324 Hum in World Lit: Lat Am   |
| 2367 | International Relations |      | or 2325 Hum in World Lit: Pol/Hist |
| 2457 | Public Policymaking     | 2463 | U.S. Maritime Hist & Pol           |
| 2361 | Western Pol Theory      | 2476 | Democracy in America               |

## *Catalog of Courses*

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Note: There are three Humanities in World Literature courses: Humanities in World Literature: Literature and the Other Arts (2323); Humanities in World Literature: Latin America (2324); and Humanities in World Literature: Politics and History (2325). Cadets should note when each course is offered so as to take the one desired, although they may take more than one if schedules permit.

### III. Track Electives:

Select either the **International Affairs** track or the **Public Policy** track. Choose four electives from those listed under the track selected. Cadets in the International Affairs track must take two semesters of Spanish, the first of which counts as a Track Elective and the second as an Other Elective. Any additional Spanish courses count as Free Electives. Cadets in the Public Policy track may take Spanish. The first course counts as an Other Elective and any additional courses taken count as Free Electives.

#### **INTERNATIONAL AFFAIRS TRACK ELECTIVES (OTHER ELECTIVES FOR PUBLIC POLICY TRACK)**

2235	Spanish I	2236	Spanish I/II
2237	Spanish II	2335	Spanish III
2337	Spanish IV	2338	Latin American Hist
2341	Europe Since 1648	2345	World War II
2349	Adv Spanish: Intl Relations	2351	Great European Leaders
2357	Russia	2454	America in Nuclear Age
2467	Global Policy Studies	2469	Natl Security Policy
2370	Contemp U.S. Foreign Policy	2471	Area Studies
2472	Drugs Policy	2474	Politics of International Econ
2483	Intelligence & Democracy	2495	Advanced Research Projects
2496	International Law		

#### **PUBLIC POLICY TRACK ELECTIVES (OTHER ELECTIVES FOR PUBLIC POLICY TRACK)**

2372	Political Participation	2389	Law and the Courts
2441	The Civil War Era	2454	Amer in Nuclear Age
2461	American Congress	2462	Select Topics in Pub Policy
2465	U.S. Military Policy	2467	Global Policy Studies
2469	National Security Policy	2470	American Presidential Policy
2472	Drugs Policy	2475	Media & American Politics
2483	Intel & Democracy	2495	Advanced Research Projects
2497	Const Law & H. S.		
8361	Supply Chain Management		

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IV. Additional Other Electives:

Cadets will choose three Other Electives from the appropriate lists above and/or the list below:

1309	Environmental Engr I	1465	Detection of Radiation Mtrls
2323	Hum in World Lit: Arts	2324	Hum in World Lit: Lat Amer
2325	Hum in World Lit: Pol/Hist	2333	Select Topics in Literature
2360	Select Topics in Philosophy	2381	Social Psychology
2429	Craft of Creative Writing	3211	Multivariable Calculus
3237	Discrete Mathematics	5445	Fisheries Management
5475	Intro to Geo Spatial Sciences		

Note: 2323/24/25 can be taken as an Other Elective by a cadet who has already passed Humanities in World Literature as a Major Requirement

V. Free Electives:

Select any two courses of interest which are 3 or more credits.

VI. Special Academic Opportunities:

Select Upper Class cadets who are deemed capable of independent research are encouraged to consider the following options:

- a. Senior Thesis in Area of Concentration (Open to Qualifying First Class Cadets) – Permission to write a thesis requires the written approval of the cadet’s advisor, the faculty member who will direct the thesis, and the department head. Cadets in this course must produce a written thesis and make an oral presentation in a meeting open to the Academy community. Only qualifying cadets will be admitted to this course.
- b. Directed Study in Government, Humanities, or Law: Written permission to undertake a directed study for course credit must be received from the cadet’s academic advisor, the faculty member who will direct the study, and the department head.
- c. Advanced Research Projects: Team-based research project entailing field and/or applied research. Project requires a major academic commitment to the design and/or assessment of governmental strategies, policies, programs, or capabilities at the national or international level.

VII. Definition of Upper Division Courses:

All non-core 23XX and 24XX level courses of 3 credits-or-greater; Track or Other Electives; courses taken at Connecticut College and approved as Track or Other Electives; pre-approved courses taken at DoD service academies as



## *Catalog of Courses*

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substitutions for Major Requirements. Courses counted as Free Electives cannot be included in the calculation. Spanish III and IV will not be included in this calculation.

### VIII. Validation and Placement Policies:

#### a. 4/c Placement

All incoming 4/c are placed into 2101, 2111, or 2121, based on a writing placement process that is conducted by the English Section during Swab Summer and involves a committee review of student writing, standardized test and reading scores, and performance in previous writing courses.

Students placed in 2101 in the fall of 4/c year are subsequently placed into either 2111: Composition and Speech or 2123 Writing About Literature in the spring of their 4/c year. This placement process involves an English Section review of cadet writing and progress in 2101. Only students who are placed in 2123 the spring of their 4/c year are permitted to substitute 2101 for 2111.

#### b. Validation

Cadets may validate courses offered by the Department of Humanities only if they have taken an accredited college course with a transcript grade of B or better and passed an examination administered by the CGA course coordinator. English composition may NOT be validated.

#### c. Advanced Placement

Cadets who have earned a score of 5 on an Advanced Placement Examination in Literature, U.S. History, or American Government must pass an examination administered by the course coordinator to be placed out of the core course into a more advanced class in the same discipline. Advanced courses for each core course are listed below:

<b>CORE COURSES</b>	<b>ACCEPTABLE SUBSTITUTIONS</b>
Writing About Literature (2123)	Selected Topics in Literature (2333) Humanities in World Literature (2323/2324/2325)
Leaders in U.S. History (2141)	American Foreign Policy (2261) Civil War Era (2441) World War II (2345) U.S. Military Policy (2465) U.S. Maritime Hist. & Policy (2463)
American Government (2263)	Public Policymaking (2457) International Relations (2367) Comparative Politics (2365)

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Cadets seeking advanced placement additionally must receive permission from the Head, Department of Humanities, via a memo routed through the cadet's academic advisor, and copy to the Registrar. Government Majors may not place out of Principles of American Government (2259) or American Government (2263).

**GOVERNMENT—GENERAL**

<b>Fall Semester</b>		<b>Spring Semester</b>	
<i>Fourth Class Year</i>	<i>Credits</i>	<i>Fourth Class Year</i>	<i>Credits</i>
0901 Fourth Class Exp	1.00	2123 Writing About Literature	3.00
1116 Statics & Engr Design	3.00	3117 Calculus II	4.00
2111 Eng Comp & Speech	3.00	4103 Personal Defense I	0.25
2141 Leaders in U.S. History	3.00	4112 Prin Fitness/Wellness II	1.00
3111 Calculus I	4.00	5106 Chemistry II	4.00
4102 Prin Fitness/Wellness I	1.00	6101 Fndmntals of Navigation	4.00
4111 Swimming I	0.25	8115 Macroeconomic Prin	3.00
5102 Chemistry I	4.00		
<i>Third Class Year</i>			
<i>Third Class Year</i>	<i>Credits</i>	<i>Third Class Year</i>	<i>Credits</i>
2259 Prin of Amer Govt	3.00	2261 Amer Foreign Policy	3.00
2293 Moral/Ethcl/Pol Phil	3.00	2365 Comparative Politics	3.00
3213 Probability & Statistics	3.00	4204 Lifetime Sports I: RQB	0.25
4222 Professional Rescuer	2.00	4214 Lifetime Sports II: Golf	0.25
5262 Physics I	4.00	5266 Physics II	4.00
6201 Ships & Maritime Sys	3.00	8211 Ldrshp & Org Behavior	3.00
6202 Apps in Navigation Lab	1.00	_____ Other Elective	3.00-
4.00			
<i>Second Class Year</i>			
<i>Second Class Year</i>	<i>Credits</i>	<i>Second Class Year</i>	<i>Credits</i>
1320 Intro to Elec & Comp Engr	3.30	23XX Hum/Wld Lit:(2323/24/25)	3.00
2367 International Relations	3.00	2361 Western Pol Theory	3.00
2391 Criminal Justice	3.00	4304 Lifetime Sports III: Tennis	0.25
2457 Public Policymaking	3.00	6301 Maritime Watch Officer	4.00
4303 Personal Defense II	0.25	_____ Other Elective	3.00-4.00
_____ Track Elective	3.00-3.50	_____ Track Elective	3.00-3.50
<i>First Class Year</i>			
<i>First Class Year</i>	<i>Credits</i>	<i>First Class Year</i>	<i>Credits</i>
2463 U.S. Maritime Hist & Pol	3.00	2476 Democracy in America	3.00
5442 Atmospherc & Mar Sci	3.00	2493 Maritime Law Enfcmnt	3.00
6401 Coast Guard Div Officer	4.00	_____ Free Elective	3.00-4.00
_____ Free Elective	3.00-4.00	_____ Other Elective	3.00-4.00
_____ Track Elective	3.00-3.50	_____ Track Elective	3.00-3.50
_____ Physical Education	0.50	_____ Physical Education	See Note

## *Catalog of Courses*

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Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

## **OPERATIONS RESEARCH AND COMPUTER ANALYSIS**

The Operations Research and Computer Analysis (ORCA) major provides graduates with a background in mathematics, statistics, and computer analysis. The primary focus is to enable our cadets to conceptualize and describe reality using the tools of mathematics and statistics, analyze possible models and solutions, use appropriate computer technology, apply these skills to specific Coast Guard problems, and effectively communicate solutions. The study of Operations Research and Computer Analysis highlights for cadets the means by which mathematics and computers can be used to analyze complex problems and improve decision-making.

While the Department of Mathematics emphasizes the practical application of mathematics, statistics, and computer techniques to “real world” problems, the central thrust of the program continues to be the understanding and applications of mathematical concepts. In addition to the courses concentrating on the tools of operations research, the Department of Mathematics offers numerous other courses covering the fundamentals of mathematical reasoning and analysis. Our graduates have a strong background in computer programming and data analysis as well as experience utilizing a number of software packages including Microsoft Access, Microsoft Excel, Minitab, and Mathematica, along with other statistics, forecasting, optimization, and simulation packages.

One of the highlights of the Operations Research and Computer Analysis major is the capstone course, Operations Analysis (3471). Here, all of the first class cadets put into practice what they have learned in the classroom throughout their 4-year career in Operations Research. The cadets work as consulting teams and are assigned to projects submitted by various Coast Guard units. The teams are required to work with project sponsors to define the problem to be investigated and to use the appropriate statistical, operations research and computer techniques to solve the problem. These projects continue to benefit the Coast Guard by providing solutions to problems encountered across the fleet and by strengthening the connectivity between the Academy and the service. Recent cadet projects as part of this capstone experience include:

- Expediting the Pilot Scheduling Process of Coast Guard Air Station Cape Cod
- Tracking and Analyzing Hazardous Waste Streams at the United States Coast Guard Academy
- The Future of the DOG (Deployable Operations Group)
- Projecting Vessel Inspection Data for Sector New York
- Assessing Waterway Risk
- District Command Center Watch Relief Scheduling
- FORCECOM Readiness Review

## *Catalog of Courses*

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- Analyzing Immigration Flows in the Caribbean
- An Analysis of Coast Guard District One Search and Rescue Operations

The Department of Mathematics sponsors a Summer Internship Program. This program provides an opportunity for professional growth for first class cadets who have displayed exceptional abilities both academically and militarily. Summer Internship Programs expand the cadets' knowledge of the Operations Research and Computer Analysis major and their understanding of the role of the Coast Guard. Internships have been offered at: the Coast Guard's Aircraft Repair and Supply Center in Elizabeth City, NC; the Office of Workforce Planning at Coast Guard Headquarters in Washington, DC; the Coast Guard Deployable Operations Group in Arlington, VA; the Homeland Security Institute in Arlington, VA; the Coast Guard Training Center at Petaluma, CA, and the Engineering and Logistics Command in Baltimore, MD.

In support of the United States Coast Guard Academy's Statement of Vision and Missions, Guiding Principles, and Shared Learning Outcomes, the Department of Mathematics' outcomes include producing graduates who:

- can effectively communicate and understand mathematical information in many venues including reading, writing, listening to, critically analyzing, and presenting;
- can interpret, model, and provide solutions to relevant problems involving traditional mathematics, statistical data, software applications, mathematical proofs, and complex real world scenarios;
- have demonstrated proficiency in all coursework required for the Operations Research and Computer Analysis degree; and
- appreciate and practice effective team membership, constructive assessment of self and others, lifelong learning, and the use of applied mathematics in solving real Coast Guard problems.

### *Acceptance into the Major*

Acceptance requires attainment of a 2.00 average in all courses taken in the Department of Mathematics prior to the 2/c year.

#### I. Core Requirements:

Substitute Probability Theory (3341) and Mathematical Statistics (3343) for Probability and Statistics (3213).

#### II. Major Requirements:

3211	Multivariable Calculus	3215	Differential Equations
3221	Linear Algebra	3231	Linear Optimization
3237	Discrete Mathematics	3333	Network and Nonlin Optim
3335	Visual Basic	3336	Information Systems
3341	Probability Theory	3343	Mathematical Statistics

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3351	Probability Models	3447	Linear Regression
3453	Decision Models	3463	Simulation w/Risk Analysis
3471	Operations Analysis	_____	Major Area Elective (1)

III. Major Area Electives:

Courses which emphasize the application of mathematics. Such courses must be documented and approved by the Head, Department of Mathematics.

IV. Upper Division Courses:

3221	Linear Algebra	3231	Linear Optimization
3237	Discrete Mathematics	3333	Ntwrk & Nonlin Optim
3335	Visual Basic	3336	Information Systems
3341	Probability Theory	3343	Mathematical Statistics
3351	Probability Models	3447	Linear Regression
3453	Decision Models	3463	Simulation w/Risk Analysis
3471	Operations Analysis	_____	Major Area Elective (1)

**OPERATIONS RESEARCH AND COMPUTER ANALYSIS—GENERAL**

<b>Fall Semester</b>			<b>Spring Semester</b>		
<i>Fourth Class Year</i>	<i>Credits</i>		<i>Fourth Class Year</i>	<i>Credits</i>	
0901	Fourth Class Exp	1.00	2123	Writing About Literature	3.00
1116	Statics & Engr Dsgn	3.00	3117	Calculus II	4.00
2111	Eng Comp & Speech	3.00	4103	Personal Defense I	0.25
2141	Leaders in U.S. Hist	3.00	4112	Prin Fitness/Wellness II	1.00
3111	Calculus I	4.00	5106	Chemistry II	4.00
4102	Prin Fitness/Wellness I	1.00	6101	Fndmntls of Navigation	4.00
4111	Swimming I	0.25	8115	Macroeconomic Prin	3.00
5102	Chemistry I	4.00			
<i>Third Class Year</i>	<i>Credits</i>		<i>Third Class Year</i>	<i>Credits</i>	
2263	American Government	3.00	3215	Differential Equations	3.00
3211	Multivariable Calculus	3.00	3231	Linear Optimization	3.00
3221	Linear Algebra	3.00	3237	Discrete Mathematics	3.00
4222	Professional Rescuer	2.00	4204	Lifetime Sports I: RQB	0.25
5262	Physics I	4.00	4214	Lifetime Sports II: Golf	0.25
8211	Ldrshp & Org Behavior	3.00	5266	Physics II	4.00
			6201	Ships & Maritime Sys	3.00
			6202	Apps in Navigation Lab	1.00
<i>Second Class Year</i>	<i>Credits</i>		<i>Second Class Year</i>	<i>Credits</i>	
2393	Moral & Ethical Phil	3.00	1320	Intr to Elec & Comp Engr	3.30
3333	Network & Nonlin Optim	3.00	2391	Criminal Justice	3.00

***Catalog of Courses***

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3335	Visual Basic	3.00	3336	Information Systems	3.00
3341	Probability Theory	3.00	3343	Mathematical Stats	3.00
4303	Personal Defense II	0.25	3351	Probability Models	3.00
6301	Maritime Watch Officer	4.00	4304	Lifetime Sports III: Tennis	0.25

<i>First Class Year</i>		<i>Credits</i>			<i>Credits</i>
2493	Maritime Law Enfrcmnt	3.00	3471	Operations Analysis	3.00
3447	Linear Regression	3.00	5442	Atmospherc & Mar Sci	3.00
3453	Decision Models	3.00	6401	Coast Guard Div Officer	4.00
3463	Simulatn w/Risk Anlys	3.00	_____	Free Elective	3.00-4.00
_____	Free Elective	3.00-4.00	_____	Major Area Elective	3.00-4.00
_____	Physical Education	0.50	_____	Physical Education	See Note

Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

## **MARINE AND ENVIRONMENTAL SCIENCES**

The Marine and Environmental Sciences (MES) major focuses on physical, chemical, and biological aspects of the marine environment. Specific topics include meteorology; wind-driven and deep ocean circulation; estuarine processes; marine geochemistry; chemistry of oil; the safe transport and storage of hazardous materials; survey of marine life, biological productivity; fisheries management; and human influence on the marine environment. Laboratories, which include field studies on the Thames River in the Marine Science boat, allow students to gain hands-on experience in weather forecasting, computer modeling of the wind-driven ocean circulation, collecting and analyzing oceanographic data, chemical identification of unknown compounds, identification of marine organisms, analysis of commercial fishing techniques and use of geospatial technologies to study the marine environment. Applications of theory to solving Coast Guard problems are emphasized throughout the curriculum. Courses are primarily quantitative in nature and require a good understanding of physics, chemistry, and calculus. In addition to the Academy's Shared Learning Outcomes, the Marine and Environmental Sciences Program Educational Objectives include producing graduates who:

1. Are Knowledgeable and Competent
  - Demonstrate scientific and technical proficiency
  - Synthesize information from data, knowledge from information, and wisdom from knowledge and experience
2. Think and Are Aware
  - Exhibit critical and other forms of thinking
  - Be aware of self, situation, and surroundings (changing conditions)
3. Communicate Effectively
  - Communicate results of one's work, as an oral presentation, scientific poster presentation, and technical or non-technical writing
4. Are Leaders and Role Models
  - Demonstrate Coast Guard Core Values
  - Exhibit character and integrity
  - Be self-sufficient and self-confident

### ***Acceptance into the Major***

Acceptance requires attainment of a 2.00 average in the following courses:

- 3111 Calculus I
- 3117 Calculus II



## *Catalog of Courses*

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3211 Multivariable Calculus  
3215 Differential Equations  
5102 Chemistry I  
5106 Chemistry II  
5232 Marine Biology  
5234 Marine Geochemistry  
5238 Physical Oceanography  
5240 Meteorology  
5262 Physics I  
5266 Physics II

### I. Core Requirements:

Substitute Physical Oceanography (5238) for Atmospheric and Marine Sciences (5442).

### II. Major Requirements:

3211	Multivariable Calculus	3215	Differential Equations
5240	Meteorology	5232	Marine Biology
5234	Marine Geochemistry	5330	Geospatial Sciences I
5415	Hazardous Materials	5445	Fisheries Management

### III. Major Area Electives:

Complete courses for two of the following three subject areas:

#### **Physical**

5350 Ocean Dynamics  
5352 Waves and Tides  
5436 Coastal Oceanography

#### **Chem-Environmental**

5306 Physical Chemistry  
5312 Analytical Methods in Chemistry  
5402 Organic Chemistry

#### **Bio-Environmental**

5334 Fisheries Biology  
5342 Biological & Chemical Oceanography  
5441 Marine Pollution

### IV. Upper Division Courses:

5247	Projects in Marine Science	5306	Physical Chemistry
5312	Analytical Methods/Chem	5330	Geospatial Sciences I
5334	Fisheries Biology	5338	Marine Forecasting
5342	Biol & Chem Oceanography	5350	Ocean Dynamics
5352	Waves and Tides	5364	Semi-conductor Physics
5366	Astronomy	5389	Directed Studies in Physics

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5399 Directed Studies in Chemistry	5402 Organic Chemistry
5415 Hazardous Materials	5417 Toxicology
5419 Biochemistry	5421 Projects in Chemistry
5420 Chemometrics	5429 Research in Chemistry
5430 Geospatial Sciences II	5436 Coastal Oceanography
5441 Marine Pollution	5445 Fisheries Management
5459 Research in Mar Science	5469 Rsrch in Geospatial Sciences
5477 Optics	

**MARINE AND ENVIRONMENTAL SCIENCES—GENERAL**

<b>Fall Semester</b>			<b>Spring Semester</b>		
<i>Fourth Class Year</i>			<i>Credits</i>		
0901	Fourth Class Exp	1.00	2123	Writing About Literature	3.00
1116	Statics & Engr Design	3.00	3117	Calculus II	4.00
2111	Eng Comp & Speech	3.00	4103	Personal Defense I	0.25
2141	Leaders in U.S. History	3.00	4112	Prin Fitness/Wellness II	1.00
3111	Calculus I	4.00	5106	Chemistry II	4.00
4102	Prin Fitness/Wellness II	1.00	6101	Fndmntls of Navigation	4.00
4111	Swimming I	0.25	8115	Macroeconomic Prin	3.00
5102	Chemistry	4.00			
<i>Third Class Year</i>			<i>Credits</i>		
3211	Multivariable Calculus	3.00	3215	Differential Equations	3.00
4222	Professional Rescuer	2.00	4204	Lifetime Sports I: RQB	0.25
5232	Marine Biology	4.00	4214	Lifetime Sports II: Golf	0.25
5240	Meteorology	4.00	5234	Marine Geochemistry	3.50
5262	Physics I	4.00	5238	Physical Oceanogrphy	3.50
6201	Ships & Maritime Sys	3.00	5266	Physics II	4.00
			6202	Apps in Navigation Lab	1.00
			8211	Ldrshp & Org Behavior	3.00
<i>Second Class Year</i>			<i>Credits</i>		
1320	Intro to Elec/Comp Engr	3.30	2263	American Government	3.00
3213	Probability & Statistics	3.00	4304	Lifetime Sports III: Tennis	0.25
4303	Personal Defense II	0.25	6301	Maritime Watch Officer	4.00
5330	Geospatial Sciences I	3.50	_____	Free Elective	3.00-4.00
_____	Major Area Elective	3.00-4.00	_____	Major Area Elective	3.00-4.00
_____	Major Area Elective	3.00-4.00	_____	Major Area Elective	3.00-4.00
<i>First Class Year</i>			<i>Credits</i>		
2391	Criminal Justice	3.00	2393	Moral & Ethical Phil	3.00
6401	Coast Guard Div Officer	4.00	2493	Maritime Law Enfrcmnt	3.00

### *Catalog of Courses*

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_____	Free Elective	3.00-4.00	5415	Hazardous Materials	3.00
_____	Major Area Elective	3.00-4.00	5445	Fisheries Management	3.00
_____	Major Area Elective	3.00-4.00	_____	Free Elective	3.00-4.00
_____	Physical Education	0.50	_____	Physical Education	See Note

Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

## MANAGEMENT

The Management (MGT) degree program provides a solid foundation for service as Coast Guard officers by preparing students to become effective managers and adept stewards of Coast Guard fiscal, human, and information resources. Students receive a broad undergraduate education in all major business disciplines: accounting, behavioral/organizational science, finance, human resource management, economics, management, marketing, operations management, management of information systems, quantitative methods, and strategic management. Additionally, students in the Management degree program will undertake a series of academic leadership courses. The degree program culminates with an engaging capstone experience where teams of students are paired with non-profit and public-sector clients to perform management consulting projects that draw upon their collected knowledge in the major business disciplines. This degree program is accredited by AACSB International – the Association to Advance Collegiate Schools of Business.

The following are the learning outcomes for graduates of the management degree program:

- **Leadership:** Graduates of the Management major shall be leaders of character who understand and demonstrate sound leadership principles and competencies. Graduates shall function effectively as leaders, followers, and facilitators. Graduates shall be able to conduct critical self-reflection and assessment. Graduates shall be able to direct, develop, and evaluate diverse individuals and groups
- **Communications:** Graduates of the Management major shall be good listeners. Graduates shall be able to write clearly, concisely, and effectively. Graduates shall be able to deliver effective practiced, professional oral presentations and be able to speak confidently extemporaneously.
- **Critical Thinking:** Graduates of the Management major shall be able to effectively integrate their knowledge and skills of/in leadership, communications, technology, and business competencies into a rational decision-making and problem-solving framework.
- **Business Competencies:** Graduates of the Management major shall understand and demonstrate the following business competencies: (a) accounting, (b) economics, (c) management, (d) quantitative analysis, (e) finance, (f) marketing, (g) international issues, (h) legal and social environment issues, and (i) management of information systems.

## *Catalog of Courses*

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### *Acceptance into the Major*

Acceptance requires attainment of a grade of C or above in the following courses:

2111	English Composition and Speech or Equivalent
3213	Probability and Statistics
8211	Leadership and Organizational Behavior
8246	Financial Accounting

#### I. Core Requirements:

No substitutions are allowed.

#### II. Major Requirements:

Major Area Requirements are in addition to the Management-related courses required as part of the core curriculum.

8201	Intro to Mgmt & Bus	8217	Microeconomic Principles
8246	Financial Accounting	8331	Management Info Systems
8348	Managerial Accounting	8342	Marketing
8349	Financial Management	8357	Human Resources Mgmt
8363	Operations & Project Mgmt	8366	Leadership & Org Dev
8441	Legal Environ Business	8443	Strategic Management
8445	Public Mgmt Consulting		

#### III. Major Area Electives:

Select two of the following courses as Major Area Electives. Note: Other courses may be accepted as Major Area Electives if explicitly approved in writing by the Department Head prior to the beginning of the semester in which taken.

1224	Intro to Comp Prog*	1362	Software Design I*
1432	Comp Comms & Network*	3335	Visual Basic*
3341	Probability Theory	3343	Mathematical Statistics
8343	Public Sector Economics	8353	Systems Analysis & Design*
8358	Negt & Conflict Mgmt	8361	Supply Chain Management
8413	Managerial Economics	8417	Investment Theory
8419	Info Technology in Orgs*	8423	Management Control
8425	Global Business & Econ	8429	Managerial Psychology
8439	Diversity & Leadership	8448	Select Topics in Fin/Acct/Ec
8449	Select Topics in IS/DS*	8450	Select Topics in Mgmt
8468	Drctd Studies in Fin/Acct/Ec	8469	Directed Studies in Mgmt
8470	Directed Studies in IS/DS*		

\* Cadets who wish to pursue graduate studies in Information Systems are encouraged to take Intro to Computer Programming (1224) as a Major Area Elective in the fall semester of 2/c year and Software Design I (1362) as an MAE in the fall semester of 1/c year. In order to do this, Criminal Justice (2391)

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should be moved to the fall semester of the 1/c year and Maritime Law Enforcement (2493) should be moved to the spring of the 1/c year. These students are then encouraged to take one of the other IS-related MAE's as a free elective in the fall semester of 1/c year (moving Maritime Law Enforcement (2493) to the spring semester) and either Information Technology in Organizations (8419) or Computer Communications and Networking (1432) as a free elective in the spring semester of the 1/c year. This sequence of courses fulfills the prerequisite undergraduate requirements as suggested by the Special Interest Group for Management Information Systems (SIGMIS).

#### IV. Upper Division Courses:

Those 83XX and 84XX numbered courses normally taken in the 2/c and 1/c year, respectively, as per the Management major program of study.

#### MANAGEMENT—GENERAL

<b>Fall Semester</b>		<b>Credits</b>		<b>Spring Semester</b>		<b>Credits</b>	
<i>Fourth Class Year</i>				<i>Credits</i>			
0901	Fourth Class Exp	1.00	2123	Writing About Literature	3.00		
1116	Statics & Engr Dsgn	3.00	3117	Calculus II	4.00		
2111	Eng Comp & Speech	3.00	4103	Personal Defense I	0.25		
2141	Leaders in U.S. Hist	3.00	4112	Prin Fitness/Wellness II	1.00		
3111	Calculus I	4.00	5106	Chemistry II	4.00		
4102	Prin Fitness/Wellness I	1.00	6101	Fndmntls of Navigation	4.00		
4111	Swimming I	0.25	8115	Macroeconomic Prin	3.00		
5102	Chemistry I	4.00					
<i>Third Class Year</i>				<i>Credits</i>			
2263	American Government	3.00	1320	Int to Elec & Comp Engr	3.30		
4222	Professional Rescuer	2.00	3213	Probability & Statistics	3.00		
5262	Physics I	4.00	4204	Lifetime Sports I: RQB	0.25		
6201	Ship/Mritme Sys Knowledg	3.00	4214	Lifetime Sports II: Golf	0.25		
6202	Appls in Navigation Lab	1.00	5266	Physics II	4.00		
8201	Intro to Mgmt & Bus	3.00	8211	Ldrshp & Org Behavior	3.00		
8217	Microeconomic Prin	3.00	8246	Financial Accounting	3.00		
<i>Second Class Year</i>				<i>Credits</i>			
2391	Criminal Justice	3.00	2393	Moral & Ethical Phil	3.00		
4303	Personal Defense II	0.25	4304	Lifetime Sports III:Tennis	0.25		
6301	Maritime Watch Officer	4.00	8342	Marketing	3.00		
8331	Management Info Syst	4.00	8349	Financial Management	3.00		
8348	Managerial Accounting	3.00	8363	Operations & Proj Mgmt	3.00		
8357	Human Resources Mgmt	3.00	8366	Ldrshp & Org Devel	3.00		

### *Catalog of Courses*

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<i>Fourth Class Year</i>	<i>Credits</i>		<i>Credits</i>
2493 Maritime Law Enfrmnt	3.00	5442 Atmosphere & Mar Sci	3.00
6401 Coast Guard Div Officer	4.00	8441 Legal Environ Business	3.00
8443 Strategic Management	3.00	8445 Public Mgmt Consulting	3.00
_____ Major Area Elective	3.00-4.00	_____ Major Area Elective	3.00-4.00
_____ Free Elective	3.00-4.00	_____ Free Elective	3.00-4.00
_____ Physical Education	0.50	_____ Physical Education	See Note

Note: First class cadets must take one health or physical education elective. A minimum of 6 academic credits in HPE courses are required for graduation.

# NOTES



## **PART V — COURSES**

### **0901 FOURTH CLASS EXPERIENCE**

This first-year orientation course focuses on providing 4/c cadets (Freshman) opportunities for self-discovery, self-assessment, and systematic personal engagement in academic, social, professional military, and community-based learning activities as they make the transition from SWAB Summer (the academy's seven-week initial military indoctrination period) to becoming full-fledged college students. The course is aligned with the academy's Guide to Officership and Leader Development (GOLD) process. Large and small faculty-led instruction, career development sessions, and independent self-paced learning activities based on cadets' interests and identified needs are included as a part of this course. Designed to assist cadets in their individual growth and development as they assume their roles as young adults in general and within the greater U.S. Coast Guard community in particular, the course also provides cadets with access to information, programs, materials, and activities on a wide range of mandatory as well as self-selected topics that can help them succeed academically and during the performance of their current and military duties.

Credit Hours: 1.00

Format: Class/Tutorial/Project/Independent Study/Teams/Lecture/Workshop/ Online/Off-Site

Prerequisites: Completion of course activity sign-ups prior to first day of class. Completion of LASSI (Learning and Study Strategies Inventory). Completion of ASVAB (ASVAB/Career Exploration Assessment)

Projected Offering: Fall

### **0924 CONNECTICUT COLLEGE**

Single-course exchange program with Connecticut College. Offers cadets an opportunity to enhance their background by enrolling in a free elective. Enrollment is normally limited to one semester and to a course not available at CGA.

Credit Hours:

Format:

Prerequisites:

Projected Offering: Fall and Spring

### **0925 SCHOLAR'S PROJECT**

Independent study and research in an area of interest to the highly qualified cadet. It requires a major academic commitment of the cadet to problem definition, analysis, and evaluation. An oral presentation and written reports are required.

Credit Hours:

Format:

Prerequisites:

Projected Offering: Spring

**0933 JUNIOR HONORS COLLOQUIUM**

Introduction to the standards of excellence and requirements for prestigious postgraduate fellowships such as the Rhodes, Marshall, Fulbright, Mitchell, Truman, Gates Cambridge, and Hertz. Grading is Satisfactory/Unsatisfactory.

Credit Hours: 1.00

Format:

Prerequisites: Recommendation by Academic Advisor and Honors Director

Projected Offering: Spring

**0935 SENIOR HONORS COLLOQUIUM**

Information, advising, and support for first-class cadets who are applying for prestigious postgraduate fellowships. Grading is Satisfactory/Unsatisfactory.

Credit Hours: 1.00

Format:

Prerequisites: Recommendation by Academic Advisor and Honors Director

Projected Offering: Fall

**0940 PEER TUTORING**

A tutorial program which matches pre-selected cadet volunteers who have performed well in particular academic subjects with other cadets who need help. This program not only facilitates the academic success of students in need but also helps the tutor cadets develop good teaching skills. (Grading is Satisfactory/Unsatisfactory.)

Credit Hours: 1.00

Format: Tutorial

Prerequisites:

Projected Offering: Fall and Spring

**0941 PEER TUTORING**

A tutorial program which matches pre-selected cadet volunteers who have performed well in particular academic subjects with other cadets who need help. This program not only facilitates the academic success of students in need but also helps the tutor cadets develop good teaching skills.

Credit Hours: 1.00

Format: Tutorial

Prerequisites:

Projected Offering: Fall and Spring

**1116 STATICS AND ENGINEERING DESIGN**

An introduction to the techniques of engineering problem solving and design. An introduction to vectors, composition of forces, and the drawing and use of free

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body diagrams. The study of distributed force systems, concentrated forces and Coulomb friction as applied to structures. The course emphasizes the application and analysis of collinear, concurrent and non-concurrent two- and three-dimensional equilibrium force systems applied to particles and rigid bodies, including beams, trusses, frames and machines. These techniques are also applied in ship stability analyses involving weight shift, addition and removal. The course includes an integrated, multi-discipline project with written reports.

Credit Hours: 3.00

Format: Class

Prerequisites:

Projected Offering: Fall and Spring

### **1204 ENGINEERING MATERIAL SCIENCE**

Introduction to metallurgy for engineers with an emphasis in crystal structure and defects, dislocation theory, diffusion, mechanical properties, fracture, strengthening mechanisms, phase transformations, fatigue, creep, corrosion, welding, and various metal alloys. Lab experiments and demonstrations include: cold rolling and annealing, Charpy impact testing, Jominy end-quench, casting, forging, independent study, and field trips to local industry to relate theory to engineering applications.

Credit Hours: 4.00

Format: Class/Laboratory

Prerequisites: 1116 and 5106

Projected Offering: Spring

### **1206 MECHANICS OF MATERIALS**

The study of stress, strain and deformations resulting from loads applied to deformable bodies. Major topics include stress-strain relationships, torsion, normal stress, shear stress, combined stresses, beam deflection, column buckling, and design of beams and shafts.

Credit Hours: 3.50

Format: Class/Laboratory

Prerequisites: 3117 and 1116

Projected Offering: Fall

### **1208 INTRODUCTION TO MECHANICAL ENGINEERING DESIGN**

Techniques of engineering design and problem solving. Introduction to computer use in the design process including analytical tools and computer-aided design. Engineering drawing, sketching and visualization. Familiarization with manufacturing techniques. Study and practice of the design process through individual and group projects. Fundamental physical and mathematical concepts used in the design process, as well as the ethical and sociological considerations of technology. Design assignments address idea generation, modeling, and project management techniques including scheduling and economic analysis. Projects apply all

of the aspects of problem solving, design, and reporting results.

Credit Hours: 3.00  
Format: Class/Laboratory  
Prerequisites:  
Projected Offering: Fall

**1211 DYNAMICS**

Kinematics and kinetics of particles and rigid bodies in two dimensions under the effects of unbalanced force systems. Principles of force and acceleration; work and energy; impulse and momentum; damped and undamped single degree of freedom vibration. Engineering applications.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1116  
Projected Offering: Spring

**1218 ELECTRICAL ENGINEERING I**

An introductory course in linear circuit analysis that develops the fundamental tools necessary for further success in the EE field. Students are introduced to the following topics: models of circuit elements; circuit analysis using Ohm's and Kirchoff's laws; nodal and mesh analysis; basic ideal operational amplifier circuits; Thevenin and Norton equivalent circuits, solution of first and second order circuits; phasor-based solutions to AC circuits; elementary frequency response. MATLAB is introduced and used throughout the course. An emphasis is placed on the formulation and solution of linear systems of equations, including a system of differential equations, through traditional and computer aided methods. This course builds upon the background gained in physics and calculus courses and prepares students for taking Signals, Systems and Transforms (1222), Digital Circuits and Computer Systems (1324), Antennas and Propagation (1420) and Linear Circuits (1322).

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 3115 or 3117  
Corequisite: 3215  
Projected Offering: Fall

**1222 SIGNALS, SYSTEMS AND TRANSFORMS**

The study of continuous and discrete linear systems through signal analysis, singularity functions, convolution, Fourier transforms, Laplace transforms and Z-transforms. The formulation and solution of differential (and difference) equations by using transform techniques. The time and frequency domain analysis of linear systems via calculations, theoretical computer simulations using MATLAB software, and physical laboratory systems is examined.

Credit Hours: 4.00  
Format: Class/Laboratory

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Prerequisites: 1218 (or 1321) and 3215

Projected Offering: Spring

### **1224 INTRODUCTION TO COMPUTER PROGRAMMING**

This course will introduce students to programming on two levels – the abstract and the concrete. At the abstract level we will discuss the programming principles of algorithm and flow of control, including sequential execution, selection, iteration, and subroutine. At the concrete level students will put principles into practice by writing programs in two modern programming languages: MATLAB® and C++. Laboratory work and programming projects will give students experience in both languages.

Credit Hours: 3.00

Format: Class/Laboratory

Prerequisites:

Projected Offering: Fall

### **1301 MATERIALS FOR CIVIL AND CONSTRUCTION ENGINEERS (TRANSFERS)**

Special course in Material Science - aggregates, concrete, and asphalt - to accommodate transfers into the Civil Engineering Major for students who have completed 1204.

Credit Hours: 2.00

Format: Class/Laboratory

Prerequisites: 1204

Projected Offering: Fall

### **1302 MATERIALS FOR CIVIL AND CONSTRUCTION ENGINEERS**

The study of the civil engineering and construction materials such as aggregates, concrete, asphalt concrete, steel, wood and geosynthetics. Emphasis is placed on understanding the engineering properties of these materials and how they affect material selection, construction methods and performance. The relevant aspects of the science and technology of the engineering properties are discussed, but focus is on practical applications, construction practices and quality control. Placement and construction methods/procedures, especially for Portland cement concrete (PCC), asphalt concrete (AC) and major applications of geosynthetic materials are addressed. Students will be exposed to the use of standard specifications and methods of testing for the determination or evaluation of the engineering properties of these materials. Course includes a pavement design project and two field trips.

Credit Hours: 4.00

Format: Class/Laboratory

Prerequisites: 1116

Projected Offering: Fall

**1304 SOIL MECHANICS AND FOUNDATION DESIGN**

A study of the engineering characteristics of soil. The fundamentals of soil behavior, and its use as a construction material. The effect of water movement through soil including flow nets. The effective stress principle, one-dimensional settlement analysis, shear strength, lateral earth pressure, and bearing capacity of soils. The design of foundations, retaining walls and slopes.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 1116  
Projected Offering: Spring

**1309 ENVIRONMENTAL ENGINEERING I**

Introduction to the field of environmental engineering. Fundamental principles from chemistry, microbiology, hydraulics, and hydrology are applied to study the occurrence and fate of pollutants in the environment and design and analysis of engineered systems for the prevention and clean-up of pollution. Legal, political, and ethical aspects of environmental engineering are explored. The laboratory segment includes experimental design, performance of basic laboratory experiments, and field trips to water and wastewater treatment facilities.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 5106  
Projected Offering: Fall

**1310 ENVIRONMENTAL ENGINEERING LAB**

This course is required and only available to students who took AFA CE 362 while on exchange. The overload course consists of the laboratory portion of 1309 Environmental Engineering I.

Credit Hours: 1.00  
Format: Laboratory  
Prerequisites: 5106, AFA CE 362  
Projected Offering: Fall

**1311 SPECIAL TOPICS IN GEOTECHNICAL ENGINEERING**

This course is required and only available to students who took AFA CE 390 while on exchange. This overload course will primarily consist of topics in lateral earth pressure, retaining wall, some aspects of shallow foundations, theory of soil consolidation, training in the Geoslope/Geostudio analysis software package, and the technical paper and presentation to be completed within the framework of 1304 Soil Mechanics and Foundations in the spring semester.

Credit Hours: 1.00  
Format: Class  
Prerequisites: 1116, AFA CE 390  
Projected Offering: Spring

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### **1313 STEEL DESIGN**

Determination of building loads including dead, live, snow, and wind in accordance with ASCE Standard 7. Structural behavior and design of steel members including beams, columns, beam-columns, and tension members. Design of bolted and welded connections. All design is based on the provisions of the AISC Specification for Structural Steel Buildings.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1317  
Projected Offering: Spring

### **1317 STRUCTURAL ANALYSIS I**

Analysis of statically determinate plane structures including internal forces and moments of members. Deflection analysis using the conjugate beam and virtual work methods. Analysis of moving loads using influence lines. Statically indeterminate structural analysis using consistent deformations and slope deflection. Computer applications included.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1206  
Projected Offering: Fall

### **1320 INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING**

A comprehensive technical introduction to electrical and computer engineering topics critical to the Coast Guard and Homeland Security. Principles and applications of digital information, audio and image processing, radio communications, electronic navigation, computer communications and networking. Laboratory work incorporates MATLAB scripting, network configuration, GPS geocaching and handheld voice communications to reinforce theory and bridge technologies to Coast Guard operations in an interactive hands-on setting.

Credit Hours: 3.30  
Format: Class/Laboratory  
Prerequisites:  
Corequisite: 5266  
Projected Offering: Fall and Spring

### **1321 ELECTRIC CIRCUITS AND MACHINES**

An introduction to electric circuit analysis using Ohm's and Kirchoff's laws, Thevenin and Norton equivalents, nodal analysis of DC and AC circuits, solution of first order circuits, and the use of phasors in the solution of AC and three phase circuits. The principles and applications of electromechanical energy conversion and power systems, including transformers, DC and AC machines, induction motors, and synchronous generators.

Credit Hours: 4.00  
Format: Class/Laboratory

Prerequisites: 3115 or 3117

Projected Offering: Fall

### **1322 LINEAR CIRCUITS**

The design of filters in both continuous and discrete time is examined. Particular emphasis is placed on the relationship between the poles and zeros of transfer functions and the resulting frequency responses of networks. Extensive computer use for the design and analysis of filters. State of the art laboratory instruments are used to measure the frequency responses of the filters designed and constructed. Final project emphasizes the design and use of digital filters.

Credit Hours: 4.00

Format: Class/Laboratory

Prerequisites: 1222

Projected Offering: Fall

### **1324 DIGITAL CIRCUITS AND COMPUTER SYSTEMS**

Principles of digital systems design. Topics include number systems, Boolean algebra, Karnaugh maps, decoders, multiplexers, flip-flops, registers, counters, programmable logic devices, analysis and design of combinational and sequential circuits. Computers are used extensively in lab to control and monitor digital circuits designed and constructed by students. Labs focus on computer I/O, MultiSIM modeling, MATLAB programming, and graphical user interfaces. Top-down design is introduced, culminating in an intensive design project including a computer interface

Credit Hours: 4.00

Format: Class/Laboratory/Project

Prerequisites: 1218 or 1321 or (1320 and Major Coordinator's permission)

Projected Offering: Spring

### **1326 ELECTROMECHANICAL SYSTEMS**

Principles and applications of electromechanical energy systems. Topics include 3-phase power, induction motors, synchronous machines, DC machines, electrical power distribution, and transformers. Laboratory experiments include transformers, building AC motors and testing rotating machinery.

Credit Hours: 3.30

Format: Class/Laboratory

Prerequisites: 1218

Projected Offering: Spring

### **1327 ACOUSTICS AND MUSIC**

Examines the physics and engineering aspects of music reproduction from electric signals to acoustic waves. Requires at least one research paper with presentation to the class, and a semester project, the construction (from scratch) and testing of a set of audio speakers. Topics to be discussed include electromagnetic and elec-



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tromechanical characteristics of speaker drivers; design parameters of various types of speaker enclosures; physics of hearing and sound; electronic filters and cross-over networks; instrumentation and measurements of acoustics and sound; standards and definitions; and mechanical engineering aspects of sound reproduction.

Credit Hours: 3.00  
Format: Class/Project/Seminar  
Prerequisites: 1321 or 1218  
Projected Offering: Spring

### **1340 FLUID MECHANICS**

The study of forces produced by fluids and their effects on bodies. Fundamental fluid mechanics principles: fluid properties, fluid statics stability of floating and submerged bodies, fluid flow equations relating to the conservation of mass, momentum and energy, dimensional analysis, viscous effects related to pipe and open channel flow, lift, drag, resistance, and fluid power applications. The exploration of design for fluids systems.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1116 and 3211  
Projected Offering: Fall

### **1342 PRINCIPLES OF NAVAL ARCHITECTURE**

The first course in a three (3) semester design sequence in the Naval Architecture and Marine Engineering Major. The course covers the fundamental principles of Naval Architecture including ship nomenclature, geometry, hydrostatics, stability, subdivision, hydrodynamics, ship structures, resistance, propulsion, and ship motions. Introduction to, and use of, computational methods will follow computation by traditional numerical techniques. In the laboratory portion of the course, the student will develop the skills required for the preliminary design of a vessel. In addition, this course has been selected as that course for which the Second Class NA&ME students will participate in the Hewitt Writing Contest.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 1340  
Projected Offering: Spring

### **1346 EXPERIMENTAL METHODS IN FLUIDS AND THERMAL SCIENCES**

Experimental data analysis using uncertainty theory, curve-fitting, and statistical criteria. Basics of computerized data acquisition, analog to digital conversion, operation amplifiers, and signal conditioning. Instrumentation for flow, temperature, pressure, force, torque, strain and vibration is presented. Test planning, data point spacing, and professional society standard test procedures. The role of computer data acquisition systems to collect, analyze and display data is stressed, and computer techniques are used where possible. Weekly labs are designed to

exercise the concepts of experimental design learned in class, as well as analyze various mechanical, fluid and thermal systems. The course includes an experimental design project.

Credit Hours: 3.00  
Format: Class/Laboratory  
Prerequisites: 1211, 1321, 1340, 1351, and 3301  
Projected Offering: Fall

**1351 THERMODYNAMICS**

Fundamental principles of classical equilibrium thermodynamics. Modeling of gas and fluid properties. Thermodynamic processes. Development and application of the first and second laws of thermodynamics to steady flow, transient flow and non-flow processes. Applications of thermodynamics to power and refrigeration cycles, psychrometrics, and to the design of thermal processes.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3211, 5106, and 5262  
Projected Offering: Fall

**1353 THERMAL SYSTEMS DESIGN**

Principles of thermodynamic power cycles, including variations from the simple cycles. Combustion fundamentals. Principles of steam turbine, gas turbine, and diesel engine prime movers and their operating characteristics. System modeling and optimization, air pollution emissions and control. Design project based on course fundamentals, completed as a Heat Transfer – Thermal Systems Design course activity.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1351  
Projected Offering: Spring

**1362 SOFTWARE DESIGN I**

This course reinforces procedural programming skills and introduces object-oriented programming. It emphasizes procedural and object-oriented software design. Other topics include data structures, abstract data types, software test design, and object principles of composition, interaction, inheritance, and polymorphism. Lab work emphasizes a planned approach to software testing and debugging. Students design and implement a number of practical programs, culminating in a major software design project that is performed in groups.

Credit Hours: 3.50  
Format: Class/Laboratory  
Prerequisites: 1224 or Permission of Instructor  
Projected Offering: Fall

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### **1366 INTRODUCTION TO GUI PROGRAMMING**

This course is an introduction to graphic user interface (GUI) implementation using the object-oriented programming (OOP) facilities provided by Borland C++ Builder. Cadets will learn to place standard GUI controls, such as command buttons, check boxes, text edit boxes, and the like, on program forms, and to write code that manages the operation of these controls, retrieves user input data from them, and displays program results. Assignments will be practical GUI programming projects.

Credit Hours: 1.00  
Format: Class  
Prerequisites: 1362  
Projected Offering: Spring

### **1370 MECHANISMS**

Fundamentals of mechanisms and machinery design through introduction of the synthesis and analysis of mechanisms and machines. Rigid-body kinematics, kinetics, and dynamics as applied to linkage analysis and design. Position, velocity, acceleration, and force analyses. Weekly labs are devoted to hands-on designs, use of synthesis/analysis software, and design-build-test workshops.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 1211  
Projected Offering: Spring

### **1395 PROJECTS IN ENGINEERING**

Projects in Engineering under the direct supervision of a faculty member. The projects can be direct participation in laboratory projects, research, or individual projects requiring periodic instructor review. Specific projects can involve construction of hardware, computer software, experimental work, or a paper study. Final written report required. May be taken only as an overload.

Credit Hours: 1.00  
Format: Project  
Prerequisites: Approval of Advisor and Major Coordinator  
Projected Offering: Fall and Spring

### **1401 CONSTRUCTION PROJECT MANAGEMENT**

This course provides an introduction to the management practices of the construction industry, specifically focusing on how projects are planned and executed. Topics include facility planning, design and contracting methods, construction drawings, specifications, scheduling, life-cycle cost estimating, facility risk analysis, engineering ethics, and overall project management. Contemporary issues of the industry will also be analyzed, including sustainable design.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: Senior Status

Projected Offering: Fall

**1402 CIVIL ENGINEERING DESIGN**

Civil Engineering Capstone Design Course requiring students to plan, design, and manage a complex open-ended civil engineering project. In accomplishing this goal, students produce engineering design documents, construction drawings, cost estimates, construction schedules, and any other necessary project specific documents. In addition, students communicate the results of their project via a final report and presentation to their client.

Credit Hours: 4.00  
Format: Project  
Prerequisites: 1401  
Projected Offering: Spring

**1404 GEOTECHNICAL ENGINEERING DESIGN**

This course provides students with the tools required for the design of geotechnical support systems. The focus is on the design of these systems through the completion of several project assignments. Course components include subsurface exploration, design of shallow foundations, design of pile foundations, design of drilled shafts foundations, lateral earth pressure and design of rigid and flexible retaining structures, construction dewatering, soil improvement, and ground modification.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1304  
Projected Offering: Fall

**1407 ENVIRONMENTAL ENGINEERING II**

A follow-on to Environmental Engineering I. Design and analysis of water distribution systems, sewer systems, and physical, chemical, and biological treatment processes for water and wastewater treatment.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1309  
Projected Offering: Spring

**1408 SURVEYING**

A study of surveying techniques as applied to property and construction surveys. Differential leveling, traverses, and topographic mapping are studied. Methods for calculating areas and volumes are covered. Proper use of standard surveying equipment such as levels, theodolites, tapes, and total stations are examined. Laboratory project: conducting a topographic survey and preparing a map of an assigned traverse.

Credit Hours: 3.00  
Format: Class/Laboratory

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Prerequisites: 3/c Standing

Projected Offering: TBD

### **1411 REINFORCED CONCRETE DESIGN**

Fundamentals of reinforced concrete behavior and design. Detailed coverage of behavior and design of singly and doubly reinforced beams, T-beams, slabs, beam columns and spread footings. Additional topics: reinforcement placing, bar cut-offs, and bonds. Design and detailing based on current ACI code. Course includes extensive Excel programming and the design, construction and testing of a full-scale reinforced concrete beam.

Credit Hours: 3.00

Format: Class

Prerequisites: 1206 and 1302

Projected Offering: Fall

### **1414 STRUCTURAL DESIGN FOR EXTREME EVENTS**

Consistent with homeland security concerns, course examines the analysis and design of structures for extreme events, including blast and earthquake loads. Background in fundamental concepts of structural dynamics theory necessary to predict structural response and performance under extreme events, including: dynamics of single and multiple degree-of-freedom systems for various load functions; approximation methods for dynamic analysis; dynamic material behavior; elasto-plastic structural response. Study of blast and earthquake load characteristics. Design philosophies for building security and strategies to enhance earthquake and blast-resistant performance. As a side topic, control of building floor vibrations under conventional loads is also addressed.

Credit Hours: 3.00

Format: Class

Prerequisites: 1313, 1411, and 3215, or permission of Instructor

Projected Offering: Spring (not offered in spring 2010)

### **1417 STRUCTURAL ANALYSIS II**

Analysis of statically indeterminate structures by the moment distribution method. Matrix methods for the analysis of plane trusses and frames, including element formulations, transformation matrices, assemblage of structural stiffness matrices, load and displacement vectors, and post-processing. Additional structural analysis/ design topics based on instructor's expertise and interests.

Credit Hours: 3.00

Format: Class

Prerequisites: 1317

Projected Offering: TBD

### **1419 DIRECTED STUDIES IN CIVIL ENGINEERING**

Individual projects in Civil Engineering involving reading, design, analysis, or applications.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Permission of Civil Engineering Section Chief  
Projected Offering: Fall and Spring

**1420 ANTENNAS AND PROPAGATION**

Fundamentals of electromagnetic theory are presented. Maxwell's equations are developed from physical phenomenon. Plane electromagnetic wave propagation in various media. Propagation of waves on transmission lines, including computer simulations on ideal and practical lines. Antenna fundamentals are described. Performance of simple antennas and arrays. Design of simple antenna arrays and broad band antennas is presented. Computer aided design of antenna arrays, structures, and shipboard antennas is presented. A final design project gives each student the opportunity to design, construct, and test a multi-element array.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 1218, 3211, and 5266  
Projected Offering: Fall

**1422 COMMUNICATION SYSTEMS**

An analysis and design of communication systems with an emphasis on digital systems. Baseband and passband transmission systems are investigated. Coherent and noncoherent modulation/demodulation schemes are presented. Error correction coding, line codes, correlation, and intersymbol interference are also reviewed. Modulation techniques include analog AM and FM as well as digital BPSK, FSK and MSK. Related laboratory exercises make extensive use of Digital Signal Analyzers, Digital Storage Oscilloscopes and computers to study properties of communication signals and system.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 1222, 1322 and 3341  
Projected Offering: Fall

**1424 COMPUTER CONTROL SYSTEMS**

This course introduces the student to classical methods of automatic control theory and design. The class will first learn to model linear systems. Using these models, the class will explore the system's time and frequency response, conduct error analysis and determine stability, then use classical compensation methods to control the system. This course will expand on the theory and applications seen in previous courses, namely Signals, Systems and Transforms, and Linear Circuits. The laboratory exercises will apply classroom concepts to design a real-time controller for linear time-invariant systems. Modern controls theory will be explored as time permits. Computer applications MATLAB and Simulink will be used extensively.

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Credit Hours: 3.50  
Format: Class/Laboratory  
Prerequisites: 1222 and 1322  
Projected Offering: Spring

### **1426 PROJECTS IN ELECTRICAL AND COMPUTER ENGINEERING I**

This is the first of two capstone courses in Electrical and Computer Engineering during the senior year. The focus of this course will be taking students through the first half of the Engineering Design Cycle. Classroom discussions will focus on the engineering design process including needs identification, system requirements, system design process and engineering ethics. Additional lectures will center on contemporary electrical and computer engineering topics. In the lab, cadets begin a two-semester major engineering design project. Working as an apprentice engineer alongside faculty members and contractors as part of a small Coast Guard project team, students are confronted with real-world engineering problems that require formal resolution with no predetermined outcome. A typical project includes requirements definition, computer programming, computer algorithm design and system implementation, data gathering and analysis, and presentation of results in a paper and oral presentation. Field trips to Coast Guard labs and project related trips to various locations are included.

Credit Hours: 4.00  
Format: Class/Laboratory/Project  
Prerequisites: 1/c EE major or ECE Section Chief approval  
Projected Offering: Fall

### **1429 DIGITAL SIGNAL PROCESSING**

The development of basic DSP concepts to support an exposure to DSP applications is examined. Sampling theory, quantization, digital filters, Z-domain analysis, and Discrete Fourier Transforms serve as a basis for applications such as: speech compression, recognition, modeling and synthesis; digital audio processing; and, digital image processing. An integrated approach of theory and hands-on learning is used. The labs consist of computer programming and simulation along with implementing DSP systems using DSP hardware. Analysis of results is aided by the use of laboratory test equipment and computer software.

Credit Hours: 3.00  
Format: Class/Laboratory  
Prerequisites: 1222 and 1322  
Projected Offering: Spring

### **1431 ELECTRONIC NAVIGATION SYSTEMS**

An engineering study of electronic navigation systems used throughout the Coast Guard. Navigation tools such as Loran-C, Radar, Sonar, radio beacons, Global Positioning Systems (GPS), Differential GPS (DGPS), Wide Area Augmentation (WAAS) corrected GPS, and aircraft navigation systems (ILS, VOR and DME) are studied. Comparative analysis of the systems in both the time and frequency

domains is studied. Other possible topics: propagation predictions, skywave effects, coverage diagrams, and weather effects.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1218 or 1321 or permission of the Instructor  
Projected Offering: Spring

**1432 COMPUTER COMMUNICATIONS AND NETWORKING**

This course is an introduction to computer communications and networks. The course starts with approaches to networks designs and key factors in network evolution. The OSI reference model is used as a basis for studying TCP/IP. Peer-to-peer, Local Area Network, and Medium Access Control protocols are all discussed. The course concludes with a study of security protocols. Laboratory work includes analysis of network communications at the hardware and logical levels. Interwoven throughout the course is preparation for, and participation in, the joint-services Cyber Defense Exercise (CDX).

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 3213 or 3301 or 3341  
Projected Offering: Spring

**1435 INTRODUCTION TO AERODYNAMICS**

This course provides the necessary tools to understand the dynamics of flow fields and their impact on solid (aerodynamic) bodies. The course uses the fundamental laws of conservation (mass, momentum and energy) to develop the necessary equations of motion for inviscid, incompressible flows. Lifting theory for flow over 2-D airfoils (symmetric and cambered) and finite wings is presented. References and comparisons are made to surface ship hydrodynamics. Software tools are introduced and implemented in solving more complex problems. Preliminary aspects of compressible flow are introduced.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1340 and 1351  
Projected Offering: Spring

**1436 PROJECTS IN ELECTRICAL AND COMPUTER ENGINEERING II**

This is the second senior-year capstone course in Electrical and Computer Engineering and completes the cadet's electrical and computer engineering program of instruction. The focus of this course will be taking students through the second half of the Engineering Design Cycle, and Project Management. Classroom discussions will cover system testing, system reliability, team management, budgeting and scheduling. Additional lectures will cover engineering ethics, engineering economics and contemporary electrical and computer engineering topics. During the Laboratory periods, cadets bring their two-semester major engineering project to a close, and present the results to Academy faculty and to professionals from



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Coast Guard Headquarters and various Coast Guard engineering commands. Field trips to Coast Guard labs and project-related trips to various locations are included.

Credit Hours: 4.00  
Format: Class/Laboratory/Project  
Prerequisites: 1426  
Projected Offering: Spring

### **1439 DIRECTED STUDIES IN ELECTRICAL ENGINEERING**

Individual or group study of topics involving design, analysis, or applications of electric and electronics devices, systems, or principles.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: 1218 and 1222 and ECE Section Chief approval  
Projected Offering: Fall and Spring

### **1440 MACHINE DESIGN**

Design of machine elements, including considerations such as material strength, manufacturing processes, safety, reliability, stress concentration, fatigue, corrosion, and tribology. Mechanical power transmission devices, including shafts, gears, belts, springs, fasteners, bearings and couplings. Introduction to mechanical component integration and design-build-test projects.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 1206, 1370  
Projected Offering: Fall

### **1442 PRINCIPLES OF SHIP DESIGN**

This course involves extensive use of the design process; application of estimation and iteration procedures with emphasis on preliminary hull dimensions and weight estimates; preliminary subdivision and development of general arrangements; intact stability analysis; and a longitudinal strength analysis. A seakeeping analysis based on the ship's operating requirements is conducted to determine the Operability Indices for mission-related operations in various sea states. Computer Aided Design software is used to develop hull geometry and interior arrangements. State of the art analysis tools are implemented to analyze hydrostatic characteristics and make an intact stability assessment in various loading conditions. This course runs concurrently with the Ship Structures course (1455) and Ship Propulsion Design course (1453) and addresses the hull design, arrangements, and missions of the senior project. The project is completed in the Ship Design/System Integration course (1444).

Credit Hours: 4.00  
Format: Class/Project  
Prerequisites: 1342  
Projected Offering: Fall

**1444 SHIP DESIGN/SYSTEM INTEGRATION**

The Capstone design course for the Naval Architecture and Marine Engineering Major includes: Geometrically scaled model hull construction and resistance testing; electrical plant and selected auxiliary system design and analysis; project planning; marine propulsion plant selection and integration; heating, ventilation and air conditioning system design and analysis; engineering economics; trade-off studies in design, construction and life cycle costing applied to preliminary ship design developed in Principles of Ship Design (1442). The emphasis is on integration of hull and machinery systems into complete vessel package.

Credit Hours: 4.00  
Format: Class/Project  
Prerequisites: 1442, 1455 and 1453  
Projected Offering: Spring

**1446 MECHANICAL ENGINEERING DESIGN**

Integrated design of mechanical systems including consideration of system performance, safety, reliability, cost, project management, and socio-ecological impacts. Engineering economy in design. Engineering ethics case studies and engineering standards. Advanced topics in modeling and testing of system components, numerical simulation of system characteristics, and system design optimization. The utilization of CAD design system. Capstone design projects require the application of the design process, including idea generation, concept design, prototype design and detailed design.

Credit Hours: 4.00  
Format: Class/Project  
Prerequisites: 1440  
Projected Offering: Spring

**1451 INTRODUCTION TO SEAKEEPING**

Seakeeping is the study of the motions of a ship or floating structure, when subjected to waves, and the resulting effects on humans, systems, and mission capability. This course introduces special analysis and uses it to model sea wave excitation. Ship motions are studied with six degree of freedom rigid body motions and Response Amplitude Operators (RAO's) are introduced. Seakeeping performance is measured with performance criteria and discussed. Considerations for preliminary design are introduced as well as methods of controlling of ship motions.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 1211, 1340, 3301  
Projected Offering: Fall

**1453 SHIP PROPULSION DESIGN**

An advanced marine engineering design course requiring the application of sound

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judgment and analysis to engineering decisions. Students complete an individual preliminary design of an optimum propulsion system that meets specific operating specifications. Significant emphasis is placed on technical/scientific/professional writing through 7-8 design reports. Topics covered include hull resistance, hull vibration, fixed and controllable-pitch propeller performance, waterjet performance, propeller/waterjet selection, engine selection, engine and propulsor matching, electric drive and integrated power systems, reduction gear selection and design, engine room layout, propeller shafting design and propeller shaft vibration. This course runs concurrently with the Principles of Ship Design course (1442) and the Ship Structures course (1455) and addresses the propulsion design of the senior project. The project is completed in the Ship Design/System Integration course (1444).

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 1351 and 1353  
Projected Offering: Fall

### **1455 SHIP STRUCTURES**

This course runs concurrently with the Principles of Ship Design (1442) and the Ship Propulsion Design (1453) courses and addresses the structural design of the senior project. The project is completed in the Ship Design/System Integration course (1444). The course includes still water and wave induced vessel loading. The analysis of primary, secondary and tertiary hull stresses and the application of ABS rules to ship structural design are addressed. Longitudinal bending and shear are discussed as well as elastic and plastic plate bending and buckling. Fatigue is also introduced, as well as hull materials and vessel construction methods. The course includes homework and project work that is tailored to support the capstone design being developed in this course and concurrent courses. In addition a model scale structural design and construction project is assigned to provide an opportunity to apply and integrate the basic principles of buoyancy, stability, and marine structures.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 1204 and 1206  
Projected Offering: Fall

### **1458 SOFTWARE DESIGN II**

This course continues the study of software design. Major topics include data structures (lists, stacks, queues, hash tables, trees, and graphs) and accompanying algorithms, and common methods for algorithm design (greedy, backtracking, and divide-and conquer). Focus is on using standard data structures and algorithms in the design of software to solve specific problems. Lab work emphasizes a planned approach to software design, testing and debugging. Students design and implement a number of practical programs, culminating in a major software design project that is performed in groups.

Credit Hours: 3.50  
Format: Class/Laboratory  
Prerequisites: 1362  
Projected Offering: Spring

**1459 HEAT TRANSFER**

Application of Fourier's law of conduction to one and two dimensional steady and non-steady state heat flow problems. Radiation heat transfer with black and gray surfaces. Newton's Law of Cooling applied to problems of forced convection. Analysis of heat transfer systems and engineering design using mass and energy continuity concepts. Design applications. Design project based on course fundamentals.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1351  
Projected Offering: Spring

**1460 MODELING AND CONTROL OF DYNAMIC SYSTEMS**

The introduction to modeling mechanical systems and obtaining time-domain and Laplace-transform solutions. An emphasis is placed on understanding the fundamentals of simple, damped, and forced oscillations, transient response, and mechanical resonance. The commonality of modeling and analysis techniques is stressed, as well as the use of input-output differential equations. Fundamentals of automatic control systems, including block diagram, root locus, Bode diagrams, as well as proportional, proportional and derivative, and proportional-integral-derivative feedback control systems. Incorporation of computer solutions to analyze and control linear dynamic systems.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1211, 1321, and 3215  
Projected Offering: Fall

**1462 FINITE ELEMENT ANALYSIS**

Introduction to the theory and application of linear Finite Element analysis for the solution of real-world engineering problems. Review of Linear Algebra concentrating on vector and matrices manipulation. Review of Mechanics of Materials covering stress, strain, constitutive relations, and failure criteria. Modeling of physical systems; establishment of stiffness matrices; possible solution techniques using principle of virtual work and weighted residuals; application of external and internal loads and boundary conditions; practical evaluation of results including error analysis and measures of accuracy.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 1204, 1211, and 3301  
Projected Offering: Spring

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### **1465 DETECTION OF RADIOACTIVE MATERIALS**

An introduction to radioactive decay processes, the interactions of radiation with matter, radiation detection methods, and common radioactive materials, particularly those of concern for homeland security.

Credit Hours: 3.00  
Format: Lecture and Laboratory, Class/Project  
Prerequisites: 5266 and 3213 or 3301  
Projected Offering: Spring

### **1466 HEATING, VENTILATION, AND AIR CONDITIONING PRINCIPLES**

Fundamentals of heating, ventilating and air conditioning systems for buildings. Qualitative and quantitative study topics include psychrometric properties, space air conditioning for design and off-design conditions, air contaminant control, human comfort, heat transfer U-values, heat and mass transfer in buildings, transmission and infiltration losses, solar radiation fundamentals and irradiation modeling, fenestration heat gains, cooling loads, heat extraction rate, fuel estimation, air distribution, fan selection and duct design basics. The Department of Energy simulation software may be used.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 1351  
Projected Offering: Spring

### **1469 DIRECTED STUDIES IN NAVAL ARCHITECTURE AND/OR MARINE ENGINEERING**

Individual Projects in Naval Architecture and/or Marine Engineering involving reading, design, analysis, or applications. End of project deliverable is required; generally a publishable paper, Coast Guard article/report, and/or a presentation.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Approval of Advisor and NA&ME Section Chief  
Projected Offering: Fall and Spring

### **1479 DIRECTED STUDIES IN MECHANICAL ENGINEERING**

Individual or group projects in Mechanical Engineering involving design analysis, or applications. Preparation of a project report or presentation is required.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Approval of Advisor and Major Coordinator  
Projected Offering: Fall and Spring

### **1480 DESIGN PROJECT MANAGEMENT**

Principles and techniques for creative idea generation and problem solving. Design processes applicable to engineering projects. Techniques for project scheduling and management. Technical communication skills for oral presentations,

proposals, written reports and video production. CAD applications. Preliminary planning for capstone projects.

Credit Hours: 3.00

Format: Class

Prerequisites: 1/c Engineering Majors with Instructor's Permission

Projected Offering: Fall

#### **1489 SELECTED TOPICS IN ELECTRICAL AND COMPUTER ENGINEERING**

This course will explore topics in electrical engineering and computing that expand upon the basic curriculum at the Academy. Instructors will select topics from subjects such as developing software for distributed computing on a network, processor architecture and assembly language programming, operating systems, or numerical methods in computation. Course material will include instruction and practical projects related to the selected topic. Cadets may repeat this course for credit with a different topic.

Credit Hours: 1.00

Format: Class/Laboratory

Prerequisites: Varies according to the specific topic

Projected Offering: Fall and Spring

#### **1491 FUNDAMENTALS OF ENGINEERING EXAM REVIEW**

This course, offered as a review, guides 1/c cadets in the engineering majors through a series of topics with the goal of assisting them in their preparation for the Fundamentals of Engineering (FE) exam. Because this exam is the first step toward professional licensure for these engineering graduates, all 1/c engineers are encouraged to take the FE exam. Course review topics follow guidelines established by the National Council of Examiners for Engineering and Surveying. Example review topics include: Statics, Mechanics of Materials, Dynamics, Fluid Mechanics, Mathematics, Thermodynamics, Chemistry, Electric Circuits, Material Science, Engineering Economics and Probability and Statistics.

Credit Hours: 1.00

Format: Class

Prerequisites: 1/c Engineering Major

Projected Offering: Spring

#### **2101 INTRODUCTION TO COLLEGE COMMUNICATIONS**

Introduction to persuasive and informative writing to selected audiences for given purposes. Shorter and longer essays develop students' ability to write thesis statements, select evidence, and document sources within a process that supports revision. Writing practice and analysis of readings develop skills to improve coherence, diction, syntax, and conventions (grammar, punctuation, and spelling). Course also emphasizes public speaking and requires formal and informal speeches. Cadets who achieve a satisfactory level of performance in coursework and assessments, as evaluated by English faculty, will take 2123, Writing About Literature in

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the spring; all others will be required to take 2111, English Composition and Speech in the spring and 2123 as upper-class.

Credit Hours: 3.00

Format: Class

Prerequisites:

Projected Offering: Fall

### **2111 ENGLISH COMPOSITION AND SPEECH**

Instruction in the principles of oral and written communication with emphasis on logical thinking, coherence, and clarity. Practice in writing expository and persuasive essays and research papers based on the gathering and use of evidence and proper documentation.

Credit Hours: 3.00

Format: Class

Prerequisites:

Projected Offering: Fall and Spring

### **2121 THE ART OF EFFECTIVE WRITING**

Academic writing, focusing on argumentation and persuasion. Practice in oral presentation. Reading and discussion of arguments.

Credit Hours: 3.00

Format: Class

Prerequisites: Placement by English faculty

Projected Offering: Fall

### **2123 WRITING ABOUT LITERATURE**

Introduction to the genres of poetry, short stories, and plays. The figurative language of literature (ex. narrative structure, conflict, irony, and allegory) is discussed relative to the genres. The course is also a study of literary criticism for fiction. Students write intensively in this course and complete literary analysis papers as well as work on projects that improve public speaking skills.

Credit Hours: 3.00

Format: Class

Prerequisites: 2101 or 2111 or 2121

Projected Offering: Fall and Spring

### **2125 WRITING ABOUT LITERATURE (HONORS)**

A literary study of the genres of poetry, short story, and plays, this course is intended for students who demonstrate advanced standing in their writing abilities and/or in their knowledge of literature. The figurative language of literature (ex. narrative structure, conflict, irony, and allegory) is discussed relative to the genres. The course is also a study of literary criticism for fiction. Students write intensively in this course and complete literary analysis papers as well as work on projects that improve public speaking skills. Placement in this course by recommendation of English instructor only. This course replaces 2123, Writing About Literature.

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Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2101 or 2111 or 2121  
Projected Offering: Spring

**2141 LEADERS IN UNITED STATES HISTORY**

A survey of the major social, economic, political, and diplomatic developments of the United States. The course focuses on the role of key leaders using biographies, primary and secondary documents, substantial reading, writing, and discussion.

Credit Hours: 3.00  
Format: Class  
Prerequisites:  
Projected Offering: Fall and Spring

**2235 SPANISH I**

Introduction to the basics of the Spanish language. Requires composition and oral classroom drill sessions. Includes introduction to Spanish and Hispanic cultures and civilizations. Only students with no previous Spanish should register for this course.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites:  
Projected Offering: Fall

**2236 SPANISH I/II**

A one semester review of Elementary Spanish. All major topics covered in Spanish I and Spanish II will be reviewed. The course is aimed at students with any of the following backgrounds: 1. 2+ years of high school Spanish; 2. Lived in/near Latino community where Spanish language was often spoken; 3. Native/near-native speakers of another Romance Language (French, Italian, Portuguese, Catalán). Students must take online placement test: <http://webcape.byuhtrsc.org/?acct=uscga>. Password is "bears1".

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites:  
Projected Offering: Spring

**2237 SPANISH II**

A continuation of Spanish I. Requires compositions and oral classroom drill sessions. Includes introduction to Spanish and Hispanic cultures and civilizations.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 2235  
Projected Offering: Spring



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### **2259 PRINCIPLES OF AMERICAN GOVERNMENT**

Foundations, organization, and processes of American democracy and national government. Analyses of the Constitution, Congress, Presidency, judiciary, administrative agencies, political organization and behavior and their roles in the policy-making process.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141  
Projected Offering: Fall

### **2261 AMERICAN FOREIGN POLICY**

A study of the diplomatic history and foreign policy of the United States from the American Revolution to the present. The themes include continuity and change, domestic context, the policy-making process, and major events and players. Substantial reading and research assignments.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141  
Projected Offering: Spring

### **2263 AMERICAN GOVERNMENT**

Through open discussion of political issues and controversies, this course examines the framework of our democracy. We will explore the history, founding, development and structure of our system of government, and come to understand why we continue to “approach democracy.” In doing so, students will be given the opportunity to examine the strengths and weaknesses of American national government. We will also explore such topics as political parties, voting, elections, interest groups, the media, civil liberties, civil rights, domestic policy and foreign policy. The course is divided into five parts. Part I presents the foundations of American government. Part II explores the institutions of American democracy. Part III focuses on the processes of American Government and democracy. Part IV provides a detailed analysis of various issues of civil rights and liberties. Finally, Part V addresses the policy-making processes and its consequences.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 2141  
Projected Offering: Fall and Spring

### **2283 EVALUATION AND COUNSELING**

This is an introduction to the techniques, theory, and problems in the area of performance appraisal and counseling specific to military officers. Discussion issues will include decision making, multiculturalism, the influence of attitudes and values on judgment, and task analysis.

Credit Hours: 3.00  
Format: Seminar

Prerequisites:

Projected Offering: Spring

**2285 SOCIAL SCIENCE RESEARCH METHODS**

Introduction to the concepts, methods, and tools used in the analysis and presentation of data in the social sciences. This knowledge requires an understanding of two components: research design and statistical inference. In the first component the student learns how to discriminate between theories, pose proper research questions, construct relevant hypotheses, make valid causal inferences, and test their hypotheses. The second component offers students an empirical means to pursue the scientific study of all things sociopolitical. By the end of the course, students should have mastered the basic requirements to conduct, comprehend, and critique research in the social sciences.

Credit Hours: 3.00

Format: Class

Prerequisites: 2259 or 2263, and 3213

Projected Offering: Spring

**2293 MORAL, ETHICAL, AND POLITICAL PHILOSOPHY**

Examination of a range of philosophical views on what makes our actions right or wrong and our characters good or bad. Students are encouraged to develop their own moral voice, decision-making abilities, and a respect for the place of reasoned argument in the treatment of ethical problems.

Credit Hours: 3.00

Format: Class

Prerequisites:

Projected Offering: Fall and Spring

**2315 DRAWING I**

This studio art course teaches students how to represent accurately and efficiently three-dimensional forms in space on a two-dimensional surface. The class requires the student to distinguish between what the eye truly sees and what the mind thinks it sees. Students are taught to visualize form as shape, to observe relative scale and relationships, and to confirm these observations with measurements. Students will work with simple forms in the beginning of the semester, using only line, and will progress to basic principles of one- and two-point perspective and more complex uses of line. The course is offered at the Lyme Academy College of Fine Arts in Old Lyme, CT and taught by Lyme Academy faculty. Prior studio art experience is not necessary.

Credit Hours: 3.00

Format: Studio/Three-hour course meets once a week

Prerequisites:

Projected Offering: Spring

## *Catalog of Courses*

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### **2323 HUMANITIES IN WORLD LITERATURE: LITERATURE AND THE OTHER ARTS**

Like 2324 and 2325, this course's curriculum may vary from year to year. Relationships among works of literature and the other arts, including painting, sculpture, music, dance and film. Emphasis will be on the development of Modernism in twentieth century architecture, visual art, film and literature. Government majors who have taken 2324 or 2325 may take this course as an Other Elective.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2123 or 2125  
Projected Offering: Spring

### **2324 HUMANITIES IN WORLD LITERATURE: LATIN AMERICA**

Like the other HWL courses, 2323 and 2325, this course's curriculum may vary from year to year, though its primary emphasis is on literature from outside the traditional Western canon. This course will focus on Latin American, Caribbean, and Latino literature, especially works written by Cuban Americans, Mexican Americans, and Puerto Ricans. Government majors who have taken 2323 or 2325 may take this course as an Other Elective.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2123 or 2125  
Projected Offering: Spring-Even

### **2325 HUMANITIES IN WORLD LITERATURE: POLITICS AND HISTORY**

Reading of literature linked to important themes of the Government major, especially to the material covered in Western Political Theory, Comparative Politics, and the capstone course in the major. Like the other HWL courses, 2323 and 2325, this course's curriculum may vary from year to year. The course's focus in 2002 was Utopias and Dystopias in literature and political theory; in 2004, Medieval Europe: Crusades and Chivalry. Government majors who have taken 2323 or 2324 may take this course as an Other Elective.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2123 or 2125  
Projected Offering: Spring-Odd

### **2331 COAST GUARD SPANISH**

Introduction to Coast Guard, military, nautical and other pertinent vocabulary in Spanish. Includes a review of basic Spanish.

Credit Hours: 1.00  
Format: Class  
Prerequisites: 2236, 2237 or equivalent  
Projected Offering: Spring

**2333 SELECTED TOPICS IN LITERATURE**

Seminars are presented on themes and topics drawn from the world's literature. Subject matter, which varies with the instructor, will be announced each semester that the course is offered.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2123 or 2125  
Projected Offering: Spring

**2335 SPANISH III**

Includes grammar review; speaking and writing; selections from Spanish literature. Students not coming into this course from Spanish II or Spanish I/II at the Coast Guard Academy must take placement test at:

<http://webcape.byuhtsrc.org/?acct=uscga> — Password is "bears1"

Credit Hours: 3.00  
Format: Class  
Prerequisites: 2236 or 2237  
Projected Offering: Fall

**2336 CONVERSATIONAL SPANISH**

A course designed to help students maintain language proficiency and develop stronger conversational skills. Weekly reflection journals are required in addition to active contributions to classroom conversation. Grades are based on quality of journals, class participation, and audio recordings evaluated for breadth of vocabulary, fluidity, pronunciation and grammatical sophistication.

Credit Hours: 1.00  
Format: Class  
Prerequisites: 2335 (Spanish III) or higher  
Projected Offering: Spring

**2337 SPANISH IV**

Continuation of Spanish III.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 2335  
Projected Offering: Spring

**2338 LATIN AMERICAN HISTORY**

A survey of factors affecting Latin American history and political systems. Includes pre-Colombian, colonial, independence and modern influences. Similarities and contrasts within the region are examined. Course leads to understanding of both intra- and extra-regional patterns and relationships, including with the United States, Europe, international communism, and the third world.

Credit Hours: 3.00  
Format: Seminar

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Prerequisites: 2141

Projected Offering: Fall

### **2341 EUROPE SINCE 1648**

A study of the major political, social, economic, intellectual and international developments in Europe from the Peace of Westphalia to the end of World War II. Course requirements include papers, presentations, and substantial reading of primary sources.

Credit Hours: 3.00

Format: Seminar/Class

Prerequisites: 2141

Projected Offering: Spring

### **2345 WORLD WAR II**

Evaluation of the causes, course and consequences of World War II. Topics include the interrelationship of social, economic, political and military factors in causing, waging, and ending war. Focus is at the strategic and operational levels, with special attention given to leaders, decision-making, and historical controversies.

Credit Hours: 3.00

Format: Seminar/Class

Prerequisites: 2141

Projected Offering: Fall

### **2349 ADVANCED SPANISH: INTERNATIONAL RELATIONS**

This course focuses on Political Science and International Relations. The course is not intended to be in-depth dealing with these major areas of investigation, but rather as an overview of them and their subject matter with the explicit intent of familiarizing students with the lexicon and formal writing structures of these disciplines in Spanish. The primary course texts will be Woodford and Schmitt's *Ciencia Politica y Relaciones Internacionales*, Dozier's *Manual de Gramatica* and various online newspapers.

Credit Hours: 3.00

Format: Seminar

Prerequisites:

Projected Offering: Fall

### **2351 GREAT EUROPEAN LEADERS**

Examination of the lives of the greatest European leaders of the 20th century. Their leadership style, personality, ideology, ascent to power and historical impact will be examined through biographical and autobiographical studies, primary source documents and memoirs. The course will also analyze and compare characteristics and leadership styles and assesses the significance of their achievements and failures.

Credit Hours: 3.00

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Format: Class/Project/Seminar  
Prerequisites: 2141  
Projected Offering: Fall-Even

**2357 RUSSIA**

Analyzes the dynamics of post-Communist Russian politics against the historical backdrop of Communism and Tsarism. Cadets will also assess the impact of U.S. policies. Issues addressed will include nationalism, economic reform, and control of nuclear weapons.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141  
Projected Offering: Spring-Odd

**2360 SELECTED TOPICS IN PHILOSOPHY**

Seminar on topics drawn from historical and contemporary philosophical thought. Topics will vary each semester, and will be determined by a survey of student interests. Topics may include Eastern philosophy, American philosophy, 20th century philosophy, existentialism, philosophy of religion, philosophy in literature and drama, theory of knowledge, metaphysics, or any philosophical field other than ethics and political philosophy.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites:  
Projected Offering: Spring

**2361 WESTERN POLITICAL THEORY**

Historical development of political theory in the West. Analysis of origins of classical political theory (Plato, Aristotle, Augustine, Aquinas, Luther, Calvin) leading to the study of post-medieval and modern writers (Machiavelli, Hobbes, Locke, Rousseau, Mill, Marx, and selected twentieth-century thinkers) and schools of thought.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2259 or 2263  
Projected Offering: Spring

**2365 COMPARATIVE POLITICS**

Compares foreign political systems, ideologies and movements. Worldwide trends are explored and selected country studies undertaken.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2259 or 2263  
Projected Offering: Spring

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### **2367 INTERNATIONAL RELATIONS**

A critical examination of the classical and contemporary international relations theories. The conditions that enhance or diminish security in the international system are explored and the influence of individuals, states, and non-governmental, regional, and international organizations on each other and the overall global community are compared and discussed.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2365  
Projected Offering: Fall

### **2370 CONTEMPORARY UNITED STATES FOREIGN POLICY**

Explores U.S. foreign policy from the late Cold War period to the present. Using historical events as our guide, we examine the foreign policy decision-making process and its major actors, including the President, Congress, bureaucracy and the news media. We will conclude the course by taking a regionally organized look at foreign policy challenges confronted by the current administration. Readings for the course will include both text chapters and journal articles.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141  
Projected Offering: Spring

### **2372 POLITICAL PARTICIPATION**

Survey of the dominant modes of citizen participation in the American democratic system, including political parties, elections, interest groups, the media, social movements, and civil disobedience. Case studies include the media and the military; federal campaigns and elections; and violence in the American political tradition.

Credit Hours: 3.00  
Format: Seminar/Project  
Prerequisites: 2259 or 2263  
Projected Offering: Fall

### **2381 SOCIAL PSYCHOLOGY**

Introduction to behaviors of the individual in society with a particular focus upon the enduring principles of human interactions. The concepts affiliation, attribution, values, authority, sexism, ethnicity, violence, and aggression will be explored. The individual as a member of an organization will also be discussed.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites:  
Projected Offering: Fall

**2389 LAW AND THE COURTS**

Seminar examining the roles of law and the courts in the United States. The structure of the judiciary, judicial processes and reasoning, as well as the nature and role of law in civil society are explored to provide a foundation for critically assessing judicial policymaking and its impact.

Credit Hours: 3.00

Format: Seminar

Prerequisites: 2259 or 2263, 2391 and 2457 or Instructor approval

Projected Offering: Spring

**2391 CRIMINAL JUSTICE**

An introductory course in criminal procedure and substantive criminal law concepts that impact military leaders and federal law enforcement officers. It includes a discussion of (1) fundamental concepts and issues relating to crime and punishment in modern society, (2) Constitutional concepts that influence criminal justice processes, (3) critical procedural differences between the civilian and military criminal justice systems, and (4) substantive crimes and defenses under the Uniform Code of Military Justice, and the disciplinary tools available to military commanders.

Credit Hours: 3.00

Format: Class

Prerequisites:

Projected Offering: Fall and Spring

**2393 MORAL AND ETHICAL PHILOSOPHY**

Examination of a range of philosophical views on what makes our actions right or wrong and our characters good or bad. Students are encouraged to develop their own moral voice, decision-making abilities, and a respect for the place of reasoned argument in the treatment of ethical problems.

Credit Hours: 3.00

Format: Class

Prerequisites:

Projected Offering: Fall and Spring

**2395 RHETORIC AND COURTROOM ADVOCACY**

A year-long (fall and spring semester) course to promote your public speaking and advocacy skills, which will be honed while preparing for and representing one party in mock trials. At the conclusion of this course, the student will: (1) be a more refined speaker; (2) be skilled at persuasively advocating a particular viewpoint before a decision-maker; (3) be familiar with the fundamentals of litigation in a courtroom setting; and (4) be more comfortable speaking in front of a group of people. Extensive out of class preparation is required, as is mandatory attendance at the off-site mock-trial competitions (usually two/semester).

Credit Hours: 1.00 per semester; full-year course



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Format: Seminar  
Prerequisites:  
Projected Offering: Fall and Spring

### **2421 DIRECTED STUDIES IN HUMANITIES**

Advanced tutorial concentrating on a specific topic in literature, philosophy, the arts or foreign languages. Intensive reading and consultation with a faculty member culminating in a major project. Limited to advanced students with previous significant course work in the humanities.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Instructor and Humanities Department Head approval  
Projected Offering: Fall and Spring

### **2425 SENIOR HONORS SEMINAR**

Offered as an opportunity for 1/c cadets to engage in interdisciplinary discussions. The purpose is to assess the meaning and values of Academy education by practice in critical thinking and writing.

Credit Hours: 3.00  
Format:  
Prerequisites: Instructor approval  
Projected Offering: Fall and Spring

### **2429 THE CRAFT OF CREATIVE WRITING**

This course provides students with the opportunity to learn the craft of writing creative works, and provides them with an understanding of critical elements necessary for the creation of effective short stories, poems, and short plays. Students will share their writing in a group setting in order to improve skills through constructive criticism and supportive comment. Grading criteria will mostly be based on students' ability to use literary tools (e.g., metaphor, setting, irony . . . ) in their own creative works.

Credit Hours: 3.00  
Format: Class/Group Work/Project  
Prerequisites: 2123 or 2125  
Projected Offering: Spring

### **2439 ADVANCED SPANISH**

Rotating topics. This is an advanced conversation course. Students will be responsible for in-depth reading and analyses of literary, cultural, artistic or cinematic works. Grading based on in-class participation, papers and tests.

Credit Hours: 3.00  
Format: Class/Seminar  
Prerequisites: 2337 or equivalent  
Projected Offering: Fall

**2441 THE CIVIL WAR ERA**

Evaluation of the causes, course and consequences of the American Civil War. Themes include the development of America in the 19th century, the impact of slavery, expansion, and social change, and interrelationship of social, economic, political, military, and diplomatic factors in the war.

Credit Hours: 3.00  
Format: Class/Project/Seminar  
Prerequisites: 2141  
Projected Offering: Fall

**2449 DIRECTED STUDIES IN PHILOSOPHY**

Advanced tutorial concentrating on a specific research topic in philosophy. This is a program of intensive reading and consultation with a faculty member culminating in a major research paper. Limited to advanced students who have completed course work and shown significant interest in Philosophy.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Instructor and Humanities Department Head approval  
Projected Offering: Fall and Spring

**2454 AMERICA IN THE NUCLEAR AGE**

A study of the U.S. society and politics in the nuclear age, including scientific, cultural, strategic and political issues. Attempts at disarmament, literature focusing on nuclear weapons and nuclear holocausts, and key crises, such as the Cuban Missile Crisis, will be the focus of discussion periods during the semester. In addition to several scholarly works on the bomb and nuclear strategy and at least one novel, students will view several films that explore the consequences of nuclear weapons and nuclear war.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141  
Projected Offering: Spring

**2457 PUBLIC POLICYMAKING**

A seminar evaluating the American policymaking process. Focusing on the interrelationship between policymaking institutions (the Presidency, Congress, courts, bureaucracy, and regulatory agencies) and individual and organizational participants (interest groups, political parties, stakeholders, media, and citizens), it identifies and evaluates the policy processes and politics that characterize American national government. Case studies focus on environmental, regulatory, immigration and economic policy areas.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2259 or 2263  
Projected Offering: Fall

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### **2459 DIRECTED STUDIES IN HISTORY**

Advanced tutorial concentrating on a specific research topic in history. This is a program of intensive reading and consultation with a faculty member culminating in a major research paper. Limited to advanced students who have completed significant course work in History.

Credit Hours: 3.00

Format: Directed Studies

Prerequisites: Instructor and Humanities Department Head approval

Projected Offering: Fall and Spring

### **2461 AMERICAN CONGRESS**

This course is designed to immerse students in the theory and practice of the United States Congress. Structured around the core functions of the legislative branch - representation, legislation, and oversight - this course begins with an intensive look at the theory of Congress and transitions to a congressional simulation where students play the role of elected Members of Congress. Through the simulation, students will internalize theory while building an awareness of their role, as citizens and Coast Guard officers, in the American law-making process.

Credit Hours: 3.00

Format: Seminar

Prerequisites: 2259 or 2263

Projected Offering: Fall

### **2462 SELECTED TOPICS IN PUBLIC POLICY**

An in-depth look at a particular issue or field within public policy. Subject varies by instructor.

Credit Hours: 3.00

Format: Seminar

Prerequisites:

Projected Offering: Fall and Spring

### **2463 UNITED STATES MARITIME HISTORY AND POLITICS**

Analysis of U.S. Maritime, Naval, and Coast Guard history, and their interrelationship. The change in maritime transport throughout American history, the defense of national interests at sea, and the evolution of the Coast Guard and its roles and missions.

Credit Hours: 3.00

Format: Seminar

Prerequisites: 2141

Projected Offering: Fall

### **2465 UNITED STATES MILITARY POLICY**

Analyzes the history of American military affairs from the colonial period to the present. Themes include the relationship between American culture and war-mak-

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ing, the growth of the U.S. Military as an institution and a profession, the links between national policy, foreign policy, military policy, and military strategy, and the civil-military relationship in America.

Credit Hours: 3.00  
Format: Seminar/Class  
Prerequisites: 2141 and 2259 (or 2263); limited to 1/c and 2/c  
Projected Offering: Spring

### **2467 GLOBAL POLICY STUDIES**

Subject matter varies with the instructor. Course on Terrorism is offered under this course number.

Credit Hours: 3.00  
Format: Seminar/Class  
Prerequisites: 2141  
Projected Offering: Fall

### **2469 NATIONAL SECURITY POLICY**

Addresses the topic of U.S. national security policy from a historical, as well as contemporary, perspective. The course begins with the National Security Act of 1947, proceeds through the impact of the 1986 Goldwater-Nichols reforms, and ends with a consideration of the post-September 11, 2001 security environment.

Credit Hours: 3.00  
Format: Seminar/Class  
Prerequisites: 2141, 2259 or 2263, 2261, or Instructor approval  
Projected Offering: Fall

### **2470 AMERICAN PRESIDENTIAL POLICY**

This course examines the roles of the President, the Cabinet departments, White House staff and Executive Office agencies in making foreign and domestic policy. It examines the organization and management of the executive branch's policymaking processes as well as executive-congressional relations, and their dynamic impact on the policy-making process.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2259 or 2263  
Projected Offering: Spring

### **2471 AREA STUDIES**

The role of historic, social, economic, and cultural forces in framing the political system of a nation or a geographic area is examined. The area studied is based upon teaching resources in the department.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141  
Projected Offering: Spring

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### **2472 DRUGS POLICY**

A multidisciplinary survey of the historical, economic, cultural, political and organizational forces that have determined the character of the contemporary domestic and global challenge of illicit drugs and the U.S. policy response.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141, 2259 or 2263  
Projected Offering: Spring

### **2474 POLITICS OF THE INTERNATIONAL ECONOMY**

This course seeks to make sense of the revolutionary forces underway in the world economy and to explore what these changes mean for the future of international politics. By examining such issues as national attempts to control transnational corporations, organized crime migrants, child labor, telecommunications, the Internet, and mass media, students will be challenged to critically explore the relationship between forces at work in the global marketplace and the changing role of sovereign states, sub-state groups and individuals within the international system.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 8215  
Projected Offering: TBD

### **2475 MEDIA AND AMERICAN POLITICS**

Media and American Politics examines the dynamic and complex relationship between the news media, government (i.e. institutions, elected leaders, agencies, etc.) and the U.S. political system (i.e. parties, interest groups, the electoral system etc.) “The fourth branch of government, “a political institution,” “an integral part of the American political system,” a “tool for governing.” Each of these terms has been used to describe the power of the U.S. news media, and yet the subject receives only cursory attention in many government classes and texts. This course will give you the opportunity to delve deeper in examining the relationship between the media and politics, fostering a greater appreciation of the media’s role and influence in our political system.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2457  
Projected Offering: Spring-Odd

### **2476 DEMOCRACY IN AMERICA**

Government Major Capstone. Interdisciplinary seminar examining the evolution of American political culture and the relationship between citizenship and civil society. Especially explored are the evolution of American identity, citizenship rights, privileges and obligations; and the relationships between nation-building, citizen-

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ship and political culture in modern democracies. Major case study explores the obligation to defend the nation, the evolution of the professional military, and the special obligations within civil society that the professional military officer bears.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2141, 2259 or 2263, 2361 or Instructor approval  
Projected Offering: Spring

**2479 DIRECTED STUDIES IN GOVERNMENT**

Advanced tutorial concentrating on a specific research topic in government. A program of intensive reading and consultation with a faculty member culminating in a major research paper. Limited to advanced students who have completed significant course work in Government.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Instructor and Humanities Department Head approval  
Projected Offering: Fall and Spring

**2481 INTELLIGENCE AND NATIONAL SECURITY POLICY**

This course is for Non-Government majors only. An interdisciplinary survey and assessment of the role of the Intelligence Community (IC) in the process of developing and executing U.S. national and homeland security policies. Covered are the nature of intelligence and intelligence processes; the evolution, organization, and responsibilities of the Intelligence Community; relationships between intelligence agencies and key national and homeland security policy makers and overseers, such as the President, the National Security Council, Cabinet secretaries, and the Congress. Recent case studies illustrate the key processes, concepts, and debates regarding intelligence and its role in protecting American security. A special focus of the course is on Coast Guard Intelligence missions, organization, and functions in the post 9/11 security environment.

Credit Hours: 3.00  
Format: Lecture  
Prerequisites: 2263  
Projected Offering: Fall and Spring

**2483 INTELLIGENCE AND DEMOCRACY**

This course is intended for Government majors. Exploration of the missions, organization, and processes of the U.S. Intelligence Community; the major debates about the roles, practices and problems of national intelligence; and the Coast Guard's multi-mission intelligence roles. The course includes an examination of the various functions of intelligence including collection systems (both human and technical), critical analysis, intelligence writing, espionage and counterintelligence, covert action, and the role of intelligence in counterterrorism, trans-national and asymmetric threat. Open to Government majors in the Public Policy track and Government majors in the International Affairs track who have taken 2469 as a

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Free Elective.

Credit Hours: 3.00

Format: Seminar/Class

Prerequisites: 2259 or 2263, 2367, 2457, and 2469

Projected Offering: Spring

### **2487 DIRECTED STUDIES IN STRATEGIC INTELLIGENCE**

A semester long directed topic/research in intelligence studies culminating in the completion of an Intelligence Assessment or Intelligence related research project.

Credit Hours: 3.00

Format: Seminar/Class

Prerequisites: Instructor and Humanities Department Head approval

Projected Offering: Fall and Spring

### **2489 DIRECTED STUDIES IN PSYCHOLOGY**

Advanced tutorial concentrating on a specific topic in psychology. A program of intensive reading and consultation with sponsoring faculty member with program culminating in a major research paper.

Credit Hours: 3.00

Format: Directed Studies

Prerequisites: Instructor and Humanities Department Head approval

Projected Offering: Fall and Spring

### **2493 MARITIME LAW ENFORCEMENT**

This course focuses on legal issues associated with the Coast Guard's law enforcement mission. Topics include jurisdiction under international and domestic law, national and agency policy, self-incrimination, search and seizure, arrest, detention, use of force and self-defense, and agency and individual liability. In the process students will study maritime-related laws concerning illegal drugs, fisheries, immigration, and pollution. This course is normally reserved for 1/c cadets.

Credit Hours: 3.00

Format: Class

Prerequisites: 2391

Projected Offering: Fall and Spring

### **2495 ADVANCED RESEARCH PROJECTS**

Team-based original research projects entailing field and/or applied research for highly qualified cadets. Project requires a major academic commitment to the design and/or assessment of governmental strategies, policies, programs, capabilities, and/or organizations at the national or international level. Project also requires development of advanced research competencies. Oral briefings and final research reports are required. Cadet projects are supervised jointly by faculty and sponsoring agency teams.

Credit Hours: 3.00 per semester

Format: Directed Study  
Prerequisites: Permission of supervising team  
Projected Offering: Fall and Spring

**2496 INTERNATIONAL LAW**

The study of the principles of international law and the role(s) of international organizations. The emphasis will be on the function of international law in international relations, and the effectiveness of international law in regulating nation-state behavior, as well as its impact on military operations. The course will also take an in-depth look at sovereignty and the law of armed conflict.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2259, 2261, 2391  
Projected Offering: Fall

**2497 CONSTITUTIONAL LAW AND HOMELAND SECURITY**

A study of the principal methods by which American government officials, including judges, legislators, and Presidents, give meaning to provisions of the U.S. Constitution. The primary focus is on homeland security and its impacts on civil liberties.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 2361, 2391  
Projected Offering: Spring

**2498 SENIOR THESIS**

Advanced independent research project which is the culmination of significant course preparation in specific area of study. Guided by committee chaired by permanent faculty member, under supervision of Department Head and publicly defended. Limited to advanced students.

Credit Hours: 3.00  
Format: Directed Studies/Tutorial/Independent Research  
Prerequisites: Approval of academic advisor, thesis advisor, and Humanities Department Head  
Projected Offering: Fall and Spring

**2499 DIRECTED STUDIES IN LAW**

Advanced independent study concentrating on a specific legal topic. Requires extensive research, intensive reading and consultation with a faculty member. Culminates in a major paper comparable to a student-authored law review article. Limited to advanced students who have completed significant course work in law and government courses.

Credit Hours: 3.00  
Format: Directed Studies/Project  
Prerequisites: 2391, 2259, and one additional law course; instructor and



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Humanities Department Head approval

Projected Offering: Fall and Spring

### **3107 INTRODUCTION TO CALCULUS**

Begins a three-course sequence covering the material of the two-course sequence Calculus I (3111) and Calculus II (3117). Slower pace allows for more repetition of challenging concepts. The fundamental concepts of functions, limits, and differential calculus are presented. Techniques and applications of differentiation also are studied. Computer analysis involving Mathematica, a computer algebra system for technical computation, is utilized.

Credit Hours: 4.00

Format: Class/Project

Prerequisites:

Projected Offering: Fall

### **3111 CALCULUS I**

Presentation of the fundamental concepts of functions, limits, and differential calculus with an introduction to integral calculus. Techniques and applications of differentiation and calculating areas as limits are explored. Computer analysis involving Mathematica, a computer algebra system for technical computation, is utilized.

Credit Hours: 4.00

Format: Class/Project

Prerequisites:

Projected Offering: Fall and Spring

### **3115 CALCULUS II (V)**

Same topics as Calculus II (3117) treated in depth and at a pace consistent with the ability of the class. Computer analysis involving Mathematica, a computer algebra system for technical computation, is utilized.

Credit Hours: 4.00

Format: Class/Project

Prerequisites: Department Head approval

Projected Offering: Fall

### **3117 CALCULUS II**

Further extensive study of the fundamental concepts of differential and integral calculus. Topics include logarithmic, exponential, inverse trigonometric, and hyperbolic functions, integration techniques, applications of the definite integral, improper integrals, and infinite series. Computer analysis involving Mathematica, a computer algebra system for technical computation, is utilized.

Credit Hours: 4.00

Format: Class/Project

Prerequisites: 3111

Projected Offering: Fall and Spring

**3211 MULTIVARIABLE CALCULUS**

An introduction to differential and integral calculus for functions of several variables. Topics include vectors, vector functions, surfaces in three-dimensional space, partial differentiation, multiple integration, and vector calculus.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3115 or 3117  
Projected Offering: Fall and Spring

**3213 PROBABILITY AND STATISTICS**

An exploration of the basic concepts and rules of probability, as well as the fundamentals of statistics. Computer methods are introduced to illustrate key concepts in probability. Utilizing a data analysis computer program, students learn to explore, describe and summarize real life data. Statistical methods are presented and applied to contexts including opinion polls, financial management and engineering applications. Emphasis is placed on the development of proper statistical reasoning and how it applies to the analysis of data, with particular attention paid to the validity of necessary assumptions. Projects requiring students to analyze actual data sets are an integral part of the course.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3115 or 3117  
Projected Offering: Fall and Spring

**3215 DIFFERENTIAL EQUATIONS**

An intermediate course in the methods of solving ordinary differential equations. Topics include first order equations, higher order linear equations, Laplace transforms, systems of equations, power series solutions, numerical methods and applications.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3115 or 3117  
Projected Offering: Fall and Spring

**3221 LINEAR ALGEBRA**

The study of mathematical systems with emphasis on vector spaces, linear transformations and matrices. Topics include systems of linear equations, vector spaces, linear mappings, determinants and eigenvalue problems. Computer analysis is utilized.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3115 or 3117  
Projected Offering: Fall

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### **3231 LINEAR OPTIMIZATION**

The theory and application of deterministic models of operations research used in the optimization of linear functions of several variables subject to linear constraints. Topics include linear programming, simplex-based methods, sensitivity analysis, and integer programming. Computer analysis is utilized.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3115 or 3117  
Projected Offering: Spring

### **3237 DISCRETE MATHEMATICS**

An introduction to discrete methods and selected applications. Topics include fundamentals of logic, methods of proof, elementary number theory, set theory, mathematical induction, counting techniques, recursion, and O-notation.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3115 or 3117  
Projected Offering: Spring

### **3301 ADVANCED ENGINEERING MATHEMATICS**

An upper division course for Engineering majors designed to provide a background and working knowledge of higher level mathematics not provided in other courses. The topics introduced are Linear Algebra and Probability and Statistics. The primary objectives are to develop a basic understanding of matrix algebra techniques and probability theory, utilize these concepts in solving a variety of Engineering applications, and the ability to read and discuss the fundamentals of the topics introduced. Computer projects will be assigned to enable students to solve more complex problems further demonstrating the application of the concepts to Engineering applications.

Credit Hours: 4.00  
Format: Class  
Prerequisites: 3215  
Projected Offering: Spring

### **3311 ADVANCED CALCULUS**

A rigorous approach to the topics of limits, continuity, differentiation, integration, optimization, and infinite series of a single variable.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3211 and permission of Instructor  
Projected Offering: Spring

### **3333 NETWORK AND NONLINEAR OPTIMIZATION**

The theory and application of network problems, nonlinear programming, and

dynamic programming. Computer analysis is utilized.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3211, 3231 or permission of instructor  
Projected Offering: Fall

### **3335 VISUAL BASIC**

An introduction to programming using Visual Basic. Topics include programming fundamentals, decision structures, loops, arrays, algorithms, objects, software design and debugging. Exercises with an emphasis on Coast Guard applications enable cadets to write programs that are robust, well structured, and exploit the capabilities of Visual Basic.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3237 or permission of instructor  
Projected Offering: Fall

### **3336 INFORMATION SYSTEMS**

An introduction to computer information systems development utilizing databases. Topics include computer hardware and software, software design and development processes, database concepts, database design, and database applications development with Access and Excel. Exercises and a project with an emphasis on decision support applications enable cadets to develop information systems that are well structured and exploit database technology.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3335  
Projected Offering: Spring

### **3341 PROBABILITY THEORY**

A rigorous development of probability theory necessary for advanced work in mathematics, statistics, operations research, and engineering. Topics covered include combinatorial methods, probability rules, discrete and continuous random variables, multi-dimensional distributions, moments and moment generating functions, special distributions, functions of random variables, and the central limit theorem. Computer analysis is utilized.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3211  
Projected Offering: Fall

### **3343 MATHEMATICAL STATISTICS**

A mathematical development of statistical procedures such as point estimation methods and theory, confidence intervals, hypothesis test design, including the Neyman-Pearson Lemma and generalized likelihood ratio testing. Also covered are

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sampling distributions, contingency tables, and goodness of fit. Computer analysis is utilized.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3341  
Projected Offering: Spring

### **3351 PROBABILITY MODELS**

An introduction to stochastic models used to describe dynamic systems. Topics include Markov Chains, queuing systems, reliability theory, and forecasting. Applications are examined from many areas with an emphasis placed on Coast Guard related systems. Computer analysis is utilized.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3215, 3221, and 3341  
Projected Offering: Spring

### **3417 NUMERICAL ANALYSIS**

A mathematical development of modern numerical approximation techniques. Topics include solutions of non-linear equations, solutions of simultaneous equations, interpolation, differentiation and integration. Practical applications are emphasized. The advantages, disadvantages and limitations of techniques are investigated, paying particular attention to convergence and associated error. Projects require students to select and implement numerical techniques using available computer software.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3215 and 3221  
Projected Offering: Spring

### **3441 EXPLORATORY DATA ANALYSIS**

An introduction to the process of data analysis including data preparation, statistical estimation and presentation of results. Methodology is illustrated with real data using appropriate software. Course content builds on the techniques discussed in Mathematical Statistics and introduces selected methodologies from the areas of non-parametric statistics, exploratory data analysis, robust statistics, and categorical data analysis.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3343  
Projected Offering: Fall

### **3447 LINEAR REGRESSION**

The fundamental development of simple and multiple linear regression models is discussed with emphasis on estimation and inference techniques. Computer analy-

sis is utilized.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3221, 3343 or 3213  
Projected Offering: Fall

**3453 DECISION MODELS**

An introduction to decision analysis, risk, utility theory, game theory, inventory models and other topics in decision modeling. Computer analysis is utilized.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3221, 3341  
Projected Offering: Fall

**3463 SIMULATION WITH RISK ANALYSIS**

Introduction to computer simulation and modeling of real-world systems. Design, implementation, and validation of computer models of discrete and continuous systems are considered. Topics include principles of computer simulation methodologies, data collection and analysis, selecting distributions, and analysis of results. Individual and group projects are an integral part of this course.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3343  
Projected Offering: Fall

**3471 OPERATIONS ANALYSIS**

A capstone project course applying mathematical, statistical, and operations research techniques to problems related to Coast Guard missions and other areas of interest. Required for all Operations Research and Computer Analysis majors during the spring semester of first class year.

Credit Hours: 3.00  
Format: Class/Project  
Prerequisites: 3447  
Projected Offering: Spring

**3479 DIRECTED STUDIES IN OPERATIONS RESEARCH**

A semester or more of individual work on a topic approved by the Head, Department of Mathematics.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites:  
Projected Offering: Fall and Spring

**4101 DEVELOPMENTAL SWIMMING**

Developmental Swimming is designed to provide cadets who have been identified

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as weak swimmers with supplemental instruction in swimming.

Credit hours: 0.00  
Format: Laboratory  
Prerequisites:  
Projected Offering: Fall

### **4102 PRINCIPLES OF FITNESS AND WELLNESS I**

This course introduces cadets to the basic concepts and principles of lifelong fitness and wellness. Special attention will be given to the areas of cardiorespiratory fitness, muscular strength and endurance, and flexibility. Cadets will be expected to apply basic exercise physiology principles in the development and maintenance of personal fitness programs.

Credit Hours: 1.00  
Format: Class/Laboratory/8-Week  
Prerequisites:  
Projected Offering: Fall

### **4103 PERSONAL DEFENSE**

Personal Defense I is an introductory level course designed to foster the development of personal defense skills. Upon completion of the course, cadets will be able to anticipate potentially unsafe situations and be able to better protect themselves. This course serves as the foundation for maritime law enforcement skills (Personal Defense II).

Credit Hours: 0.25  
Format: Laboratory/8-Week  
Prerequisites:  
Projected Offering: Spring

### **4111 SWIMMING I**

Swimming I is an introductory level course designed to develop fundamental skills in both survival and competitive strokes. By the end of the course, cadets should be competent swimmers and comfortable in the water.

Credit Hours: 0.25  
Format: Laboratory/8-Week  
Prerequisites:  
Projected Offering: Fall

### **4112 PRINCIPLES OF FITNESS AND WELLNESS II**

This course introduces cadets to the basic concepts and principles of lifelong fitness and wellness. Special attention will be given to the areas of nutrition, stress management, and the adoption of healthy lifestyle behaviors.

Credit Hours: 1.00  
Format: Class/Laboratory/8-Week  
Prerequisites: 4102  
Projected Offering: Spring

**4204 LIFETIME SPORTS I: RACQUETBALL**

Racquetball is an introductory level course designed to foster the development of fundamental skills in racquetball and to support cadet commitment to lifelong participation in physical activity.

Credit Hours: 0.25  
Format: Laboratory/8-Week  
Prerequisites:  
Projected Offering: Fall and Spring

**4214 LIFETIME SPORTS II: GOLF**

Golf is an introductory level course designed to foster the development of fundamental skills in golf and to support cadet commitment to lifelong participation in physical activity.

Credit Hours: 0.25  
Format: Laboratory/8-Week  
Prerequisites:  
Projected Offering: Fall and Spring

**4222 PROFESSIONAL RESCUER**

The Professional Rescuer course is designed to provide each cadet with the knowledge and skills to effectively respond to emergency situations in both aquatic and land-based settings. Practical scenarios will be utilized to elicit problem solving and application of rescue principles. Successful completion of this course will lead to selected certification.

Credit Hours: 2.00  
Format: Class/Laboratory/16 weeks  
Prerequisites: 4111  
Projected Offering: Fall and Spring

**4303 PERSONAL DEFENSE II: MARITIME LAW ENFORCEMENT  
TECHNIQUES**

Personal Defense II exposes cadets to maritime law enforcement techniques. Upon completion of the course, cadets will be able to execute fundamental defensive techniques and prisoner control methods used by the U.S. Coast Guard .

Credit Hours: 0.25  
Format: Laboratory/8-Week  
Prerequisites: 4103  
Projected Offering: Fall and Spring

**4304 LIFETIME SPORTS III: TENNIS**

Tennis is an introductory level course designed to foster the development of fundamental tennis skills and to support cadet commitment to lifelong participation in physical activity.



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Credit Hours: 0.25  
Format: Laboratory/8-Week  
Prerequisites:  
Projected Offering: Fall and Spring

### **4400 REMEDIAL PHYSICAL TRAINING**

Remedial Physical Training is designed to provide cadets who score below their class standard on the PFE with supplemental information and training in physical fitness.

Credit Hours: 0.00  
Format: Laboratory  
Prerequisites:  
Projected Offering: Fall and Spring

### **4401 WATER SAFETY INSTRUCTOR**

The Water Safety Instructor course is designed to provide instructor candidates with the skills and knowledge needed to teach in the American Red Cross Swimming and Water Safety Program. Instructor candidates will learn how to use American Red Cross materials, how to conduct training sessions, and how to evaluate participant progress. Successful completion of all aspects of the course will lead to American Red Cross certification. Fee required.

Credit Hours: 1.00  
Format: Class/Laboratory/16 weeks  
Prerequisites: 4111 and 4222  
Projected Offering: Spring

### **4403 MARTIAL ARTS**

This course provides instruction in strikes, punches and blocks common to martial arts styles. Sparring opportunities are provided in the second half of the course. Fee required.

Credit Hours: 0.50  
Format: Laboratory/16 weeks  
Prerequisites: 4103 and 4303  
Projected Offering: Fall and Spring

### **4404 BADMINTON**

This course provides instruction in the fundamentals of badminton. Cadets will receive instruction in technique, rules and tactical play for both singles and doubles.

Credit hours: 0.25  
Format: Laboratory/8 weeks  
Prerequisites:  
Projected offering: Fall and Spring

### **4405 ADVENTURE SPORTS I: ROCK CLIMBING**

This course provides instruction in basic belaying, rappelling and climbing techniques. Climbing safety is a major focus. Fee required.

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Credit Hours: 0.50  
Format: Laboratory  
Prerequisites:  
Projected Offering: Fall

**4407 DANCE**

This course provides instruction in different forms of dance. Offerings include ballet, jazz, modern, tap and hip hop. This course is conducted off campus. Fee required.

Credit Hours: 0.50  
Format: Laboratory  
Prerequisites:  
Projected Offering: Fall and Spring

**4409 HORSEBACK RIDING**

This course is designed to provide instruction in the fundamentals of horsemanship, including corral and trail riding, using western style saddles. Instruction geared to individual level of proficiency. Fee required. Classes are held at an off campus site.

Credit Hours: 0.50  
Format: Laboratory/16 weeks  
Prerequisites:  
Projected Offering: Fall and Spring

**4411 SCUBA DIVING**

This course provides instruction in basic scuba diving safety and techniques and includes open water dive experience. N.A.U.I. certification is possible with successful completion of the course. Fee required.

Credit Hours: 0.50  
Format: Laboratory/16 weeks  
Prerequisites: 4111 and 4222  
Projected Offering: Fall and Spring

**4414 ADVANCED GOLF**

This course provides advanced instruction in golf and offers cadets the opportunity to play on local courses. This course is conducted at local golf courses. Fee required for golf course play.

Credit Hours: 0.25  
Format: Laboratory/8 weeks  
Prerequisites: 4214  
Projected Offering: Fall and Spring

**4415 ADVENTURE SPORTS II**

This course provides instruction in outdoor recreational sports such as orienteering, mountain biking, hiking and boating (canoe/kayak). Some elements of this course are conducted off campus. Fees may be required.

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Credit Hours: 0.50  
Format: Laboratory/16 weeks  
Prerequisites:  
Projected Offering: Spring

### **4421 ADVANCED SCUBA DIVING**

This course provides advanced instruction in scuba diving safety and techniques for those cadets who already possess a scuba certification. This course is conducted off campus. Fee required.

Credit hours: 0.50  
Format: Laboratory/16 weeks  
Prerequisites: Scuba certification  
Projected Offering: Fall

### **4439 THEORY OF COACHING**

This course provides instruction in the theory and techniques of coaching as well as opportunities for discussion on issues in contemporary athletics.

Credit Hours: 1.00  
Format: Class/Laboratory/16 weeks  
Prerequisites:  
Projected Offering: Fall and Spring

### **4444 INDOOR RECREATIONAL SPORTS**

This course will provide instruction in popular recreational activities such as badminton, pickle ball and bowling.

Credit Hours: 0.50  
Format: Laboratory/16 weeks  
Prerequisites:  
Projected Offering: Fall and Spring

### **4459 SPORT/WELLNESS LEADER**

This course provides an opportunity for cadets to acquire and utilize teaching and leadership skills in a physical activity setting. Cadets may choose to assist with instruction in a physical education class or provide guidance to cadets in the Remedial Physical Training program.

Credit Hours: 0.50  
Format: Class/Laboratory/16 weeks  
Prerequisites:  
Projected Offering: Fall and Spring

### **4464 STRENGTH AND CONDITIONING**

This course provides instruction in the various theories and principles of strength and conditioning and follows the guidelines of the National Strength and Conditioning Association.

Credit Hours: 0.50  
Format: Class/Laboratory/16 weeks  
Prerequisites: 4102 and 4112  
Projected Offering: Spring

**4489 SELECTED TOPICS IN HEALTH AND PHYSICAL EDUCATION**

This course will explore topics in wellness and physical activity that extend skills and concepts presented in the Health and Physical Education program. Topics will vary based on instructor and student interest.

Credit Hours: 0.5 – 2.0  
Format: Dependent on topic  
Prerequisites: Permission of the Department Head  
Projected Offering: Spring

**4499 DIRECTED STUDIES IN HEALTH AND PHYSICAL EDUCATION**

This course provides an opportunity for cadets to study specific topics in the area of health and physical activity. Cadets will develop a proposal for a research paper or project, which must be completed by the end of the semester under the guidance of an HPE faculty member.

Credit Hours: 0.50  
Format: Directed Studies  
Prerequisites:  
Projected Offering: Fall and Spring

**5102 CHEMISTRY I**

Chemistry I is the first half of a one-year curriculum in general chemistry. The course presents an introduction to elementary concepts of chemistry, covering topics of matter and measurement, atomic theory and inorganic nomenclature, mass relationships, reactions in aqueous solution, gas laws and reactions, enthalpy, quantum theory, periodic trends in the elements, chemical bonding, and intermolecular forces. Comprehensive laboratory program.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites:  
Projected Offering: Fall and Spring

**5104 CHEMISTRY I (HONORS)**

Scope essentially the same as 5102 with pace and depth varied to meet the capabilities and interests of students. Typically a single class section. There is a great deal of student/instructor interaction with strong emphasis on development of critical thinking skills. This is a course for those students with a strong background as well as an interest in science or engineering, and is ideal for Marine and Environmental Sciences and other technical majors.

Credit Hours: 4.00  
Format: Class/Laboratory/Project

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Prerequisites: Chemistry Section Chief approval

Projected Offering: Fall

### **5106 CHEMISTRY II**

Chemistry II is the second half of a one-year curriculum in general chemistry. The course presents an introduction to elementary concepts of chemistry, covering the following topics: physical properties of solutions, chemical kinetics, chemical equilibrium, acid/base chemistry, acid/base equilibria, solubility equilibria, entropy/free energy/spontaneity, electrochemistry, nuclear chemistry, organic chemistry, and polymer chemistry. Comprehensive laboratory program.

Credit Hours: 4.00

Format: Class/Laboratory

Prerequisites: 5102 or 5104

Projected Offering: Spring

### **5108 CHEMISTRY II (HONORS)**

The follow on course to Honors Chemistry I with similar themes and pace of instruction. Coverage of required General Chemistry topics usually concludes around Spring Break so that the remainder of the semester can be dedicated to special topics chosen by the instructor. Taught as a single class and lab section with a great deal of student/instructor interaction and a continued emphasis on critical thinking skills. Intended for students with a strong chemistry background, an interest in science or engineering, and particularly ideal for Marine and Environmental Sciences and other technical majors.

Credit Hours: 4.00

Format: Class/Laboratory

Prerequisites: 5102 or 5104 and Chemistry Section Chief approval

Projected Offering: Spring

### **5232 MARINE BIOLOGY**

Consideration of the marine biosphere, marine life, and habitats with emphasis on interaction in food chains and human impacts. Review of plant and animal kingdoms in terms of the adaptations and ecological adjustments for marine habitats with detailed laboratory examination of specific forms.

Credit Hours: 4.00

Format: Class/Laboratory

Prerequisites: Instructor's approval for non-majors

Projected Offering: Fall

### **5234 MARINE GEOCHEMISTRY**

Introduction to the concepts of physical geology with emphasis on the marine realm. Topics include chemical exchanges at hydrothermal vents, global geochemical cycles of carbon, and the distribution of organic matter, nutrients, contaminants and metals in the environment. Labs/field trips focus on map interpretation, analytical techniques, and field surveying techniques.

Credit Hours: 3.50  
Format: Class/Laboratory  
Prerequisites: 5106 or 5108, Instructor's approval for non-majors  
Projected Offering: Spring

**5238 PHYSICAL OCEANOGRAPHY**

Introduction to descriptive and dynamical physical oceanography. The distribution and variability of seawater properties. Characteristics of the world's major ocean currents and the forces affecting them. Underwater acoustics, waves, tides, and Coast Guard oceanography. Labs emphasize collection and analysis of oceanographic data.

Credit Hours: 3.50  
Format: Class/Laboratory  
Prerequisites: 5240, 5262  
Projected Offering: Spring

**5240 METEOROLOGY**

Study of synoptic meteorology and climatology, with an introduction to atmospheric fluid dynamics. Atmospheric structure and radiative balances form the basis for understanding precipitation processes and stability. The effects of pressure and the earth's rotation on winds at local, synoptic, and planetary scales are considered, along with severe weather phenomena, local, and regional climatology. Mid-latitude storm development is emphasized, including upper-air influences and vorticity. Laboratory work emphasizes weather data collection, regional forecasting using local observations and National Weather Service products, and Coast Guard applications at sea.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: Instructor's approval for non-majors  
Corequisite: 5262  
Projected Offering: Fall

**5247 PROJECTS IN MARINE SCIENCE**

Start-up, completion, or involvement in ongoing research projects as an assistant in data collection or analysis. Final project is required.

Credit Hours: 1.00  
Format: Directed Studies  
Prerequisites: Approval of Project Advisor and Marine Science Section Chief  
Projected Offering: Fall and Spring

**5262 PHYSICS I**

Basic concepts of Newtonian mechanics, particle kinematics and dynamics, rotational kinematics and dynamics, conservation laws, oscillations, fluids, and wave motion.

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Credit Hours: 4.00  
Format: Combined Class and Laboratory  
Prerequisites:  
Corequisite: 3111  
Projected Offering: Fall

### **5266 PHYSICS II**

A study of basic concepts of electromagnetism is presented, including the study of electrostatics, magnetostatics, circuit theory, motions of particles in fields, electromagnetic waves, Faraday's law, and Ampere's law.

Credit Hours: 4.00  
Format: Combined Class and Laboratory  
Prerequisites: 3111 and 5262  
Projected Offering: Spring

### **5306 PHYSICAL CHEMISTRY**

Study of the states of matter and their properties, including ideal and real gases, kinetic theory, laws of thermodynamics, phase equilibria, chemical equilibrium, electrochemistry, chemical kinetics, atomic structure, the chemical bond, cohesion and structure, and molecular spectroscopy.

Credit Hours: 3.50  
Format: Class/Laboratory  
Prerequisites: 5106 or 5108 and 3211  
Projected Offering: Fall

### **5312 ANALYTICAL METHODS IN CHEMISTRY**

The course focuses on the theory, technology, design, function, and application of modern analytical instrumentation including liquid and gas chromatography separations and emission, absorption, mass, and nuclear magnetic resonance spectroscopies for detection and identification of organic and inorganic chemicals in air, water, soil, or biological samples. Cadets will develop scientific research and communications skills during the course that will be applied to conduct an end-of-semester original experiment with a research team. Experiments emphasize current Coast Guard and Homeland Security applications in environmental and forensic science.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 5106 or 5108  
Projected Offering: Spring

### **5330 GEOSPATIAL SCIENCES I**

This course introduces students in the Marine and Environmental Sciences major to the fundamental concepts of geospatial sciences, including modeling the real world within a Geographic Information Systems (GIS), coordinate systems (including datum and projections), sources of spatial data, entering and editing the data

within a GIS, GIS spatial data analysis techniques, and cartography. Relevancy of geospatial technologies to the Coast Guard will be demonstrated throughout the course through the use of several Case Studies. The lab portion of the course will emphasize hands-on applications of principles discussed in lecture. Students will be expected to apply GIS principles learned in lecture and lab portions of course in order to complete an end-of-semester GIS project.

Credit Hours: 3.50  
Format: Class/Laboratory  
Prerequisites: Instructor's approval for non-majors  
Projected Offering: Fall

### **5334 FISHERIES BIOLOGY**

This course addresses Ichthyology and some aspects of Fisheries Techniques. Emphasis is placed on fish classification, fish internal and external anatomy, morphology, adaptive characteristics of fishes to their habitats, and human causes of aquatic biodiversity decline. Identification of important commercial and recreational species will be learned throughout the course and with the use of keys. Indoor, outdoor labs and a field trip are designed to provide hands-on familiarity with fishes and fisheries techniques. This course requires writing of a scientific paper based on the collection and analysis of students' data and a Hewitt paper and oral presentation.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 5232 or Instructor's approval for non-majors  
Projected Offering: Fall

### **5338 MARINE FORECASTING**

An advanced meteorology course with an emphasis on forecasting, especially at sea. After reviewing concepts from 5240 or 5442, students will learn advanced concepts, skills, and techniques in marine forecasting; and master them during weekly weather briefs. Regional studies will include the Gulf of Alaska; West, East, and Gulf Coasts of the Continental U.S.; and the Caribbean Sea. Advanced concepts will include wave development, hurricanes, nor'easters, and use of National Weather Service facsimile charts at sea.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 5240, or 5442 and Instructor's approval  
Projected Offering: As Required

### **5342 BIOLOGICAL AND CHEMICAL OCEANOGRAPHY**

An ecological approach to life in the seas, with particular emphasis on energy flow through the food chain as shown by productivity of both producers and consumers. Discussion of the effects of natural vs. human-induced changes in marine ecosystems. Discussion of the data needed for mathematical modeling of specific ecosystems. Labs focus on up-to-date techniques for measuring seawater con-



## *Catalog of Courses*

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stituents relevant to the course; the last month of lab is devoted to a project/experiment designed and carried out by the student using techniques learned earlier in the semester.

Credit Hours: 4.00

Format: Class/Laboratory

Prerequisites: 5106 or 5108 and 5232, or Instructor's approval for non-majors

Projected Offering: Spring

### **5350 OCEAN DYNAMICS**

This course emphasizes the mathematical description of the ocean's response to the various forces that affect its motion. Emphasis is placed on the assumptions and approximations used in developing these mathematical descriptions, and on the physical understanding of the fluid characteristics represented by the equations. The basic concepts of fluid dynamics are first presented with an emphasis on total acceleration and continuity of volume. The equations of motion for fluids on a rotating earth are derived, and effects of turbulent motion are introduced. Steady-state solutions to the equations of motion, including Ekman dynamics, are examined. The geostrophic approximation, its consequences, and applications are discussed in detail. Theory is related to the real world through discussion of oceanic observations documented in the literature. Labs provide students the opportunity to investigate the properties and behavior of rotating fluids and to apply the equations of motion to real-world flows modeled in rotating fluid tanks.

Credit Hours: 3.50

Format: Class/Laboratory

Prerequisites: 3211, 5238, 5240, and 5262

Projected Offering: Fall

### **5352 WAVES AND TIDES**

Waves and Tides, which follows Ocean Dynamics (5350), is the second course in the Physical Oceanography course sequence. While Ocean Dynamics (5350) focuses entirely on time-independent (i.e. steady-state) flow, this course covers the time-dependent phenomena of linear ocean waves. Beginning with a mathematical treatment of surface gravity waves, the course includes discussion of ocean waves on a variety of temporal and spatial scales, from centimeter-scale gravity-capillary waves to planetary-scale Rossby waves and fundamental theories of tides. The effect of Earth's rotation is considered for large-scale waves. In the laboratory portion of the course, students learn to apply concepts and data analysis methods presented in lecture to real wave data using MATLAB, a versatile mathematical modeling software program.

Credit Hours: 3.50

Format: Class/Laboratory

Prerequisites: 3215, 5238, 5240, 5262, and 5350

Projected Offering: Spring

**5364 SEMICONDUCTOR PHYSICS**

Study of properties of semiconductors. Crystalline structure, electron energy levels, impurity levels, electrical conduction, electron and hole currents. Application to p-n junctions and semiconductor devices is presented.

Credit Hours: 3.50

Format: Class/Laboratory

Prerequisites: 3117 and 5266

Projected Offering: Spring

**5366 ASTRONOMY**

Historical and modern topics in astronomy are presented including the Solar System, stellar structure and evolution, galaxies, and cosmology. Includes night observations at the astronomical observatory and physical astronomical measurements.

Credit Hours: 3.00

Format: Class

Prerequisites: 5266, 5106 or 5108

Projected Offering: Fall

**5389 DIRECTED STUDIES IN PHYSICS**

Individual program of advanced readings or laboratory projects in physics.

Credit Hours: 3.00

Format: Directed Studies

Prerequisites: 5266 and Instructor's approval

Projected Offering: Fall and Spring

**5399 DIRECTED STUDIES IN CHEMISTRY**

Individual program of advanced readings or laboratory projects in chemistry.

Credit Hours: 3.00

Format: Directed Studies

Prerequisites: 5106 and Instructor's approval

Projected Offering: Fall and Spring

**5402 ORGANIC CHEMISTRY**

Chemical reactivity of organic compounds from a functional group perspective. Hydrocarbons, alkyl halides, aromatics, alcohols, ethers, carbonyl compounds, and amines. Laboratory introduction to important techniques of organic chemistry; the preparation of simple compounds; and analysis using mass spectrometry, nuclear magnetic resonance, infrared spectroscopy, and computer modeling.

Credit Hours: 4.00

Format: Class/Laboratory/Project

Prerequisites: 5106 or 5108

Projected Offering: Fall

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### **5415 HAZARDOUS MATERIALS**

A Marine and Environmental Sciences major capstone course that investigates the behavior of organic chemicals when they are released to the multimedia environment of air, water, soil, dissolved organic matter and biota. Quantitative multimedia distribution models based on fundamental chemical and physical properties are developed. Estimates of environmental effects are determined from the distribution models. A comprehensive final project requires that students behave as professional military scientists to solve a risk assessment problem.

Credit Hours: 3.00  
Format: Class  
Prerequisites: Instructor's approval for non-majors  
Projected Offering: Spring

### **5417 TOXICOLOGY**

Survey of the most important concepts in Toxicology. Effects of xenobiotic substances on the most important physiological systems will be covered with examples relevant to Homeland Security such as chemical warfare agents and industrial products. Exposure assessment, aerosol bio-dynamics, and dose response concepts will also be covered. Subject matter will include review of physiology as it pertains to effects of xenobiotics on the body.

Credit Hours: 3.00  
Format: Lecture  
Prerequisites: 5104 or 5108 or equivalent  
Projected Offering: Spring

### **5419 BIOCHEMISTRY**

A survey of the principles of biochemistry and molecular biology, including the structure and function of molecules important for life, such as amino acids, sugars, nucleic acids, lipids, and carbohydrates. Topics will include concepts of catabolism and metabolism, biological macromolecule structure/function relationships, DNA structure and replication, and protein synthesis. An overview of laboratory techniques important in modern biochemistry will also be covered including computational biology.

Credit Hours: 3.00  
Format: Lecture  
Prerequisites:  
Projected Offering: Fall

### **5420 CHEMOMETRICS**

A workshop-style course focused on the theory and application of multivariate and multi-way pattern recognition, curve resolution, classification, and regression. Linear algebra concepts necessary for discussion of these topics will be covered. The theory of methods including Principal Components Analysis, Parallel Factor Analysis, and Partial Least Squares regression will be covered and applied by students to instrumental and survey data sets including images.

Credit Hours: 1.00  
Format: Lecture  
Prerequisites:  
Projected Offering: Fall

**5421 PROJECTS IN CHEMISTRY**

Start-up, completion, or involvement in ongoing research projects as an assistant in data collection or analysis. Final project is required.

Credit Hours: 1.00  
Format: Directed Studies  
Prerequisites: Approval of Project Advisor and Chemistry Section Chief  
Projected Offering: Fall and Spring

**5429 RESEARCH IN CHEMISTRY**

Individual or team laboratory projects in chemistry. Final project report and presentation at Cadet Research Symposium are required.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Approval of Research Advisor and Chemistry Section Chief  
Projected Offering: Fall and Spring

**5430 GEOSPATIAL SCIENCES II**

This course examines advanced topics in geospatial sciences, including the physics and technology of remote sensing theory and advanced GIS analytical techniques. The principles of physical radiation, which form the foundation for remotely measuring surface processes, are first discussed in detail. Advanced GIS analytical techniques such as spatial, geostatistical, three-dimensional, and network analysis are then discussed. Hands-on activities allow for further application and exploration of these techniques. The lab portion of the course will emphasize hands-on applications of principles discussed in lecture. Students will be expected to apply GIS principles learned in lecture and lab portions of course in order to complete an end-of-semester GIS project.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 5330 or 5475  
Projected Offering: Spring

**5436 COASTAL OCEANOGRAPHY**

The physical oceanography of the coastal zone is studied, as well as the dynamics of tidal flows in estuaries. Estuarine circulation and mixing at tidal and non-tidal time scales. The advection/diffusion relationships, and their application to the dispersal and monitoring of pollutants. Beach processes and interactions between estuaries and the coastal ocean. Labs emphasize student proposed and conducted research in the Thames River estuary. The results are presented at a symposium at the close of the semester.

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Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 3211, 5238, 5262, and 5350  
Projected Offering: Fall

### **5441 MARINE POLLUTION**

Examination of the sources, control, disposal, and impact of pollutants affecting the marine realm, such as sewage, industrial effluents, agricultural and urban runoff, oil, solid wastes, dredge materials, and acid rain. Issues presented via a mix of scientific, political and economic perspectives. Past, current, and proposed approaches to marine pollution problems are considered.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 5232 and 5342, or Instructor's approval for non-majors  
Projected Offering: Fall

### **5442 ATMOSPHERIC AND MARINE SCIENCES**

A survey of the physical, chemical, and biological aspects of the marine environment including meteorology, ocean circulation (currents, waves, and tides), coastal processes, marine ecosystems dynamics, fisheries technology and management, and marine pollution. Students strengthen their understanding of these topics through hands-on inquiry-based activities.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 5102 and 5262, 1/c Standing or Instructor's permission  
Projected Offering: Fall and Spring

### **5445 FISHERIES MANAGEMENT**

This is a capstone course, which examines issues associated with the management and conservation of fisheries. The interaction between social, biological, economic, and political aspects of fisheries management is the focus of this course. The course is a combination of lectures, discussion, student presentations, and guest speakers. Guest speakers are invited from a variety of backgrounds including Coast Guard officers, National Marine Fisheries Service scientists, fisheries scientists, fisheries managers, and commercial fishermen, to expose students to various perspectives on fishing issues.

Credit Hours: 3.00  
Format: Class  
Prerequisites: Instructor's approval for non-majors  
Projected Offering: Spring

### **5459 RESEARCH IN MARINE SCIENCE**

Individual or team laboratory projects in marine science. Final project report and presentation at Cadet Research Symposium are required.

Credit Hours: 3.00

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Format: Directed Studies  
Prerequisites: Faculty Research Advisor and Marine Science Section Chief approval  
Projected Offering: Fall and Spring

**5469 RESEARCH IN GEOSPATIAL SCIENCES**

Individual or team laboratory projects in geospatial sciences. Final project report and presentation at Cadet Research Symposium are required.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: Faculty Research Advisor and Marine Science Section Chief approval  
Projected Offering: Fall and Spring

**5475 INTRODUCTION TO GEOSPATIAL SCIENCES**

This course introduces students not in the Marine and Environmental Sciences major to the fundamental concepts of geospatial sciences, including modeling the real world within a Geographic Information Systems (GIS), coordinate systems (including datum and projections), sources of spatial data, entering and editing the data within a GIS, GIS spatial data analysis techniques, and cartography. Relevancy of geospatial technologies to the Coast Guard will be demonstrated throughout the course through the use of several Case Studies. Students will be expected to apply GIS principles learned in lecture and lab portions of course in order to complete an end-of-semester GIS project. Students in the Marine and Environmental Sciences major cannot take this course in lieu of 5330, Geospatial Sciences I.

Credit Hours: 3.00  
Format: Class/Laboratory  
Prerequisites:  
Projected Offering: Spring, as required

**5477 OPTICS**

An introductory course in optics designed to provide a working knowledge of electromagnetic theory. The fundamental principles of geometrical (e.g., reflection, refraction) and physical optics (interference, polarization, diffraction) are introduced. The emphasis of the course is on understanding the basic physical principles underlying practical photonic devices through the use of hands-on, in-class activities.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 5266  
Projected Offering: Fall

**6101 FUNDAMENTALS OF NAVIGATION**

Fundamentals of Navigation is an exploration of the basic principles of earth's characteristics and terrestrial navigation for which a Deck Watch Officer or entry

## *Catalog of Courses*

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level officer will be responsible. In the earth's characteristics module, the emphasis is on earth's coordinate system, magnetism of the earth, chart projections, chart preparation, and various distance, speed, and time relationships. The terrestrial navigation module focuses on positioning techniques, compass computation, calculation of tides and currents, anchor selection, tactical characteristics, coastal and transoceanic voyage planning, and aids to navigation. Students are also introduced to Coast Guard requirements for celestial theory including azimuth and amplitude. The emphasis of the instruction is to prepare cadets for experiential learning afloat as a navigation team member during the common portion of the 3/c summer training program. A short research project covering selected navigational topics integrates course material and primary source research the students submit in a written form.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: None  
Projected Offering: Fall and Spring

### **6201 SHIP AND MARITIME SYSTEMS KNOWLEDGE**

Fundamental technical knowledge centered on ships and maritime systems. A baseline understanding of ships and maritime systems is developed to support future assessment of the impact, benefit, and risk of decisions involving the design, acquisition, operation, regulation, law enforcement, damage control, maintenance, and salvage of ships and maritime systems. Specific subject areas include buoyancy, stability, flooding, salvage, strength, inspections, regulation, impact of shipboard flight operations, operations, Coast Guard vessels, commercial vessels, grounding, pollution, resistance, propulsion, maneuvering, ship motions, damage control, and offshore structures.

Credit Hours: 3.00  
Format: Class/Laboratory  
Prerequisites: 6101  
Projected Offering: Fall and Spring

### **6202 APPLICATIONS IN NAVIGATION LAB**

Applications of Navigation is a lab based course that meets once per week. This course continues the developmental journey by building upon the fundamental navigation preparation of 6101 and the common experience of 3/c summer. The goal is to build proficiency in voyage planning and as a navigation team member through further preparation, practice and an introduction to navigation applications and tools available in the fleet. The first module focuses on voyage planning through the research of applicable publications prior to transiting through an unfamiliar port. The introduction to the navigation brief as a tool for risk mitigation is discussed. The second module improves the navigation team skills learned in 6101 and the proficiency required to navigate a ship through restricted, coastal and open ocean environments. The third module introduces cadets to the basics

of relative motion theory with the initial exploration of maneuvering boards for course, speed, closest point of approach, avoidance and intercepts, secondary effects, true wind and desired apparent wind.

Credit Hours: 1.00  
Format: Laboratory  
Prerequisites: 6101  
Projected Offering: Fall and Spring

### **6301 THE MARITIME WATCH OFFICER**

The Maritime Watch Officer explores knowledge and skills vital to successful performance as a Maritime Watch Officer for the entry level graduate. This course builds upon the individual navigation proficiency gained during the prerequisite courses and summer training programs and introduces new watch team skills applicable to the maritime watch. In addition to refreshing navigation team skills taught in Nautical Science I and II, students develop new skills such as advanced navigation coordination; advanced relative motion theory and practice coupled with collision avoidance and briefing the command; electronic navigation theory and practice; basic, routine and emergency shiphandling procedures and practice; external communications; and Bridge Resource Management knowledge, skills, and techniques. Classroom theoretical discussions are reinforced and applied in the various visual and radar simulators and CGA training vessels within a watch team construct. Team Coordination Training concepts are further analyzed in group projects wherein cadets present the causal factors and potential corrective actions surrounding selected Coast Guard Cutter mishaps.

Credit Hours: 4.00  
Format: Class/Laboratory  
Prerequisites: 6101, 6201, 6202  
Projected Offering: Fall and Spring

### **6401 THE COAST GUARD DIVISION OFFICER**

The Coast Guard Division officer is the capstone course in Professional Maritime Studies, supporting to varying degrees all of the Nautical Science Outcomes. It links the first three years of instruction in Professional Maritime Studies with selected Coast Guard organizational issues. The course is nearly equally divided between the operational and administrative leadership duties of a first tour officer. Classroom focus is on organizational processes and personnel administration. Search and rescue, evaluations, advancements, promotions, collateral duties and other personnel management issues are discussed in depth. Lab assignments and simulator experience reinforce critical thinking and decision-making skills in navigation, shiphandling, collision avoidance, risk assessment and mitigation and Coast Guard operations. Team Coordination Training concepts are applied in the lab environment. A major oral and written assignment requires research into current Coast Guard policies and issues as part of the Hewitt Writing series.

Credit Hours: 4.00



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Format: Class/Laboratory  
Prerequisites: 6101, 6201, 6202, 6301  
Projected Offering: Fall and Spring

### **6459 SELECTED TOPICS IN PROFESSIONAL MARITIME STUDIES**

In depth examination of a terrestrial, celestial, or electronic navigation topic or a stability, damage control, shiphandling, shipboard leadership framework or ship related training system topic. Specific course content will vary based upon emerging and relevant navigation, training, or leadership issues, institutional and organizational needs, and students' interests. Includes additional reading, writing, research, and/or casework.

Credit Hours: 1.00  
Format:  
Prerequisites: 6101  
Projected Offering: Fall and Spring

### **6469 PROJECTS IN PROFESSIONAL MARITIME STUDIES**

Start-up, completion, or involvement in ongoing research projects as an assistant in data collection or analysis. Final project is required.

Credit Hours: 1.00  
Format: Project  
Prerequisites: 6101, 6201, 6202  
Projected Offering: Fall and Spring

### **6489 DIRECTED STUDIES IN PROFESSIONAL MARITIME STUDIES**

Advanced tutorial concentrating on specific topics in the area of cutter, sector or aviation operations to include but not limited to any current tactics, practice, or procedure (TPP). It is expected the student will develop a hypothesis regarding an impaired or flawed TPP, conduct an investigation into the current state, and develop a study to quantify, document and prove/disprove the hypothesis. Cadets will develop a proposal for a research paper or project, which must be completed by the end of the semester under the guidance of a Professional Maritime Studies faculty member. Limited to advanced students who have completed course work and shown significant interest in Professional Maritime Studies.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: 6101, 6201, 6202, 6301  
Projected Offering: Fall and Spring

### **8115 MACROECONOMIC PRINCIPLES**

Examination of basic concepts, methodology and problems of macroeconomic measurement and aggregate economic activity. money, banking, international trade and finance. Macroeconomic policy for economic stability and growth.

Credit Hours: 3.00  
Format: Class

Prerequisites:

Projected Offering: Fall and Spring

**8201 INTRODUCTION TO MANAGEMENT AND BUSINESS**

Provides an overview of the history and development of management and business including the areas of planning, organizing and control. Provides an introduction to the functional areas of business as well as an introduction to the Management major.

Credit Hours: 3.00

Format: Class/Project

Prerequisites:

Restriction: Management majors only

Projected Offering: Fall and Spring

**8211 LEADERSHIP AND ORGANIZATIONAL BEHAVIOR**

Using leadership as its focus, this course examines the relationship of individual and group behavior in organizations to organizational effectiveness. Uses case studies, classroom exercises, lecture, and discussion to develop an understanding of motivation, group/team effectiveness, communications, and performance management with particular attention to the practical leadership implications of current theory.

Credit Hours: 3.00

Format: Class/Group Work/Project

Prerequisites:

Projected Offering: Fall and Spring

**8217 MICROECONOMIC PRINCIPLES**

Basic analysis of individual economic decision making in a market economy. Consumer behavior and theory of demand; production cost, theory of supply and firm behavior in different market structures. Public policy to improve market performance. Resource markets.

Credit Hours: 3.00

Format: Class

Prerequisites:

Projected Offering: Fall

**8246 FINANCIAL ACCOUNTING**

Accounting process as a system for communicating financial information to internal and external users in both profit-based and non-profit setting. Fundamental financial accounting concepts related to the balance sheet, income statement, and statement of cash flows. Introduction to government and not-for-profit accounting and application of basic cost accounting concepts. Focus on the decision-usefulness of accounting information from the perspective of the user. Extensive analytical problem-solving, both structured and unstructured.

Credit Hours: 3.00

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Format: Class  
Prerequisites:  
Projected Offering: Spring

### **8331 MANAGEMENT INFORMATION SYSTEMS**

Prepares managers to function in a technological environment. The roles of information processing in managerial decision making. The structure of information systems; development; management computing technology, data processing, and information assurance. Applications within major functional subsystems of management. The class will also discuss the role of technology in today's society, with an emphasis on the use by the Coast Guard and Homeland Security and the ethical issues raised by the misuse of technology. Laboratory work will focus on applications of the topics discussed in class. A group research project on current technology topics is required.

Credit Hours: 4.00  
Format: Class/Project/Laboratory  
Prerequisites: 1320 or permission of the instructor  
Projected Offering: Fall

### **8342 MARKETING**

Marketing concepts and their relationship to strategic management of private, public, and not-for-profit organizations. Marketing mix, market segmentation, product differentiation, demographics, and advertising, promotion, distribution. Marketing of services and marketing's role in governmental organizations.

Credit Hours: 3.00  
Format: Class/Cases  
Prerequisites:  
Projected Offering: Spring

### **8343 PUBLIC SECTOR ECONOMICS**

Application of Economic logic to public sector issues; market failure and the economic rationale for government intervention; public choice and public goods; analysis of taxation and government expenditure policy; examination of selected taxes and expenditure classifications.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 8115, 8217  
Projected Offering: On demand

### **8348 MANAGERIAL ACCOUNTING**

The examination of cost information in decision making for both the short and long terms. Topics include the different costing systems, cost behavior and estimation, standard costing and variance analysis, along with flexible budgets and control of overhead costs. Extensive analytical problem solving, including the use of cases.

Credit Hours: 3.00

Format: Class  
Prerequisites: 8246  
Projected Offering: Fall

**8349 FINANCIAL MANAGEMENT**

Application of financial theory, tools and methods to managerial decision-making with a goal of value maximization through effective cash flow management. Focus is on the investment decision (asset risk, time-value of money, cost of capital, discounted cash flow analysis) and the financing decision (financial risk, use of leverage, capital structure). Some coverage of financial markets. Extensive analytical problem solving, including the use of cases.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3213, 8246  
Projected Offering: Spring

**8353 SYSTEMS ANALYSIS AND DESIGN**

Examination of the concepts, tools, and development methodologies used in information systems analysis and design. Feasibility study, requirements analysis, design, and development documentation are covered. The system development life cycle, prototyping, data modeling, and user involvement are also covered. Course prepares students to improve organizational functions through the System Development Life-Cycle in roles varying from System Analyst to System User. A real-world application is conducted through a term project.

Credit Hours: 3.00  
Format: Class/Project/Cases  
Prerequisites: 8331 or equivalent  
Projected Offering: Spring

**8357 HUMAN RESOURCES MANAGEMENT**

Examination of the fundamentals of Human Resource management theory as it pertains to supervisors and managers. Topic coverage includes recruitment, selection, performance evaluations, retention, training issues, and EEO guidelines. Emphasis on applications of the theory. Use of student presentations and term paper.

Credit Hours: 3.00  
Format: Seminar/Cases/Project  
Prerequisites: 8211  
Projected Offering: Fall

**8358 NEGOTIATIONS AND CONFLICT MANAGEMENT**

Designed for relevance to the broad spectrum of bargaining problems faced by the manager and professional. Provides understanding of the theory and processes of negotiation as practiced in a variety of settings, including government, commercial and labor negotiations. Special emphasis on sources of power in negotiations.

## *Catalog of Courses*

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Covers conflict management as a first party and as a third party (third party skills include helping others deal directly with their conflicts, mediation, investigation, arbitration, and helping the system itself to change as a result of a dispute. Allows students an opportunity to develop negotiations skills experientially and to understand negotiation in a useful analytical framework. Emphasizes simulations, exercises, role playing, and cases.

Credit Hours: 3.00  
Format: Class/Seminar  
Prerequisites: 8211  
Projected Offering: Fall

### **8361 SUPPLY CHAIN MANAGEMENT**

The concepts, issues, and techniques for managing supply chains. Topics include transportation economics, material and distribution requirements, electronic communication and tracking systems, and international supply chain planning.

Credit Hours: 3.00  
Format: Class/Seminar  
Prerequisites: 8115, 8217  
Projected Offering: Spring

### **8363 OPERATIONS AND PROJECT MANAGEMENT**

The study of operations management and industrial applications: maintenance and production scheduling, project planning and management. Emphasis on problem solving, computer applications and case studies.

Credit Hours: 3.00  
Format: Class/Cases  
Prerequisites: 3213, 8331  
Projected Offering: Spring

### **8366 LEADERSHIP AND ORGANIZATIONAL DEVELOPMENT**

Examination of leadership issues in an organizational framework. Topics include a historical review of organizational management thought; leadership theories with organizational applications; organizational diagnosis and analysis; organizational culture, change, and improvement; and concepts that relate to leading public organizations (such as organizational vision, parallel systems, and quality concepts).

Credit Hours: 3.00  
Format: Class/Seminar  
Prerequisites: 8211  
Projected Offering: Spring

### **8413 MANAGERIAL ECONOMICS**

Analysis of microeconomic forces in managerial decision making. Topics include: consumer demand and indifference curves; production functions and cost theories; producer behavior in different market structures; pricing theories: multiproduct pricing, pricing to deter entry; and transfer pricing; vertical integration. Evaluation

of alternative firm objectives, and the non-traditional firm. Cost-benefit analysis.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 8217  
Projected Offering: Spring

**8415 PERSONAL FINANCE**

A study of issues relevant to personal finance. Topics include budgets, insurance, taxes, markets, investments, retirement, and estate planning.

Credit Hours: 1.00  
Format: Class  
Prerequisites:  
Projected Offering: Fall and Spring

**8417 INVESTMENT THEORY**

This course is an introduction to the modern investment theory. Major topics include utility theory, mean-variance portfolio construction, the Capital Asset Pricing model (CAPM), Arbitrage Pricing Theory (APT), efficient market hypotheses, interest rate theories, valuation of financial assets and their derivatives, as well as investment analysis and asset allocation to meet investment objectives.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 3213, 8217, 8349 or equivalent courses  
Projected Offering: Spring

**8419 INFORMATION TECHNOLOGY IN ORGANIZATIONS**

In-depth examination of fundamental technological and managerial issues relevant to information technology management in the U.S. Coast Guard. Topics of emphasis include: computer architecture, network theory, and system administration, analytical processes in determining an organization's information technology needs, and the Coast Guard's IT plan. Structured to address state of the market and research developments in IT. A project with emphasis on real-world applicability is required.

Credit Hours: 3.00  
Format: Class/Project/Laboratory  
Prerequisites: 8331 or permission of the Instructor  
Projected Offering: Fall

**8423 MANAGEMENT CONTROL**

Study of the management control function in public, private, and governmental organizations: planning, programming, budgeting, operating and measurement, reporting and evaluation. Managerial accounting issues related to cost analysis and its role in decision-making and control.

Credit Hours: 3.00  
Format: Seminar/Class

## *Catalog of Courses*

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Prerequisites: 8115 or 8215, 8217  
Corequisites: 8246  
Projected Offering: Fall

### **8425 GLOBAL BUSINESS AND ECONOMIC ISSUES**

Introduction to the concepts, framework and issues of global business: multinational firms; international trade; and the cultural, political, institutional, social, and economic environment of the global marketplace.

Credit Hours: 3.00  
Format: Class  
Prerequisites:  
Projected Offering: Fall

### **8429 MANAGERIAL PSYCHOLOGY**

A rigorous reading-intensive study of advanced behavioral science topics such as the MBTI, positivist psychology, transactional analysis, commitment, motivation, and emotional intelligence. Emphasis on theoretical understanding and application. Extensive student participation and class leadership.

NOTE: A significant reading assignment and entrance exam are required for admission to the course.

Credit Hours: 3.00  
Format: Class/Seminar  
Prerequisites: 8211  
Corequisites: 8366  
Projected Offering: Spring

### **8439 DIVERSITY AND LEADERSHIP**

The course will examine diversity as a complex phenomenon and provide students with the understanding necessary to lead effectively in an increasingly diverse workplace. The course will demand serious, critical engagement in order to develop the awareness, knowledge, and skills necessary to create and lead inclusive, multicultural organizations.

Credit Hours: 3.00  
Format: Seminar  
Prerequisites: 8211  
Corequisites: 8366  
Projected Offering: Fall

### **8441 LEGAL ENVIRONMENT OF BUSINESS**

Legal and policy issues affecting managerial decision-making. Topics include: business organizations, contracts and commercial transactions, environmental and employment law.

Credit Hours: 3.00  
Format: Class  
Prerequisites:

Projected Offering: Spring

**8443 STRATEGIC MANAGEMENT**

Strategy and policy development in the private and public sectors. Emphasis on environmental analysis, strategic advantage profile, social responsibility, and ethics. The relationships of finance, personnel, marketing, and structure to policy decisions. Case studies/simulation.

Credit Hours: 3.00  
Format: Class/Cases/Project  
Prerequisites: 8115, 8217, 8246, 8349, and 8366  
Restrictions: 1/c Management majors only  
Projected Offering: Fall

**8445 PUBLIC MANAGEMENT CONSULTING**

The capstone course for the Management Major teaches the fundamentals of management consulting as part of a project-based experience. Students learn the basics of internal and career consulting. Topics include the consulting process; the ethics of consulting; and issues surrounding the use of consultants. Exploring the nature of consulting from the vantage points of both consultant and client, the course is designed for students who find themselves serving as an internal consultant, do occasional consulting, or need to hire or work with external consultants.

Credit Hours: 3.00  
Format: Project/Seminar  
Prerequisites: 8357 and 8443  
Restrictions: 1/c Management majors  
Projected Offering: Spring

**8448 SELECTED TOPICS IN FINANCE, ACCOUNTING, AND ECONOMICS**

In depth examination of advanced finance, accounting, or economics topics. Specific content of course will vary based upon emerging and relevant finance, accounting, and economics theory, institutional and organizational needs, and students interests. Includes extensive reading, writing, research, and/or casework.

Credit Hours: 3.00  
Format: Class  
Prerequisites:  
Restrictions: 1/c cadets  
Projected Offering: Fall and Spring

**8449 SELECTED TOPICS IN INFORMATION SYSTEMS AND DECISION SCIENCES**

In depth examination of advanced information system or decision science topics. Specific content of course will vary based upon emerging and relevant information and decision science theory, institutional and organizational needs, and students interests. Includes extensive reading, writing, research, and/or casework.



## *Catalog of Courses*

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Credit Hours: 3.00  
Format: Class  
Prerequisites:  
Restrictions: 1/c cadets  
Projected Offering: Fall and Spring

### **8450 SELECTED TOPICS IN MANAGEMENT AND LEADERSHIP**

In depth examination of advanced management and/or leadership topics. Specific course content will vary based on emerging management and leadership theory, institutional and organizational needs, and student desires. Potential topic areas include intrinsic vs. extrinsic motivation, commitment vs. compliance, transformational leadership, visionary leadership, responsibility and accountability, strategic leadership, establishing and communicating a vision, communication and decision-making. Includes extensive reading, research, case writing, and a comprehensive writing assignment.

Credit Hours: 3.00  
Format: Class  
Prerequisites: 8366  
Restrictions: 1/c cadets  
Projected Offering: Fall and Spring

### **8468 DIRECTED STUDIES IN FINANCE, ACCOUNTING, AND ECONOMICS**

Provides the student an opportunity to work closely with a faculty member in an area of mutual interest. Potential topics include, but are not limited to, investment theory, risk management, option pricing, and advanced topics in corporate finance. Directed Studies proposal must be submitted in writing and approved by the Department Head, applicable Section Head, and sponsoring faculty member prior to the beginning of the semester.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites:  
Restrictions: 1/c Management majors and approval of Department Head  
Projected Offering: Spring

### **8469 DIRECTED STUDIES IN MANAGEMENT AND LEADERSHIP**

An in-depth, major research effort in an area of mutual interest to cadet and faculty member directing study. Directed Studies proposal must be submitted in writing and approved by the Department Head, applicable Section Head, and sponsoring faculty member prior to the beginning of the semester.

Credit Hours: 3.00  
Format: Directed Studies  
Prerequisites: 8349  
Restrictions: 1/c Management majors and approval of Department Head  
Projected Offering: Fall and Spring

**8470 DIRECTED STUDIES IN INFORMATION SYSTEMS AND DECISION  
SCIENCES**

Provides the student with an opportunity to work closely with a faculty member in an area of mutual interest. Potential topics include, but are not limited to, development of database applications, web applications, understanding and application of new technologies, and advanced topics in information systems and decision sciences. Project proposals must be approved prior to the beginning of the semester.

Credit Hours: 3.00

Format: Directed Studies

Prerequisites: 8331, 8363 or equivalent courses

Projected Offering: Spring

## PROJECTED OFFERINGS

Course	Course Title	'08-'09	'09-'10	'10-'11	'11-'12
0901	Fourth Class Experience	F	F	F	F
0924	Connecticut College	F	S	F	S
0925	Scholar's Project		S	S	S
0933	Jr Hnrs Colloquium		S	S	S
0935	Sr Hnrs Colloquium	F	F	F	F
0940	Peer Tutoring	F	S	F	S
1116	Statics & Engr Dsgn	F	S	F	S
1204	Eng Material Science		S	S	S
1206	Mechncs of Materials	F	F	F	F
1208	Into Mech Engr Dsgn	F	F	F	F
1211	Dynamics		S	S	S
1218	Elec Engineering I	F	F	F	F
1222	Sgnls/Sys & Trnsfrms		S	S	S
1224	Intro Comp Prog	F	F	F	F
1301	Civil Engr Mtrls (T)	F	F	F	F
1302	Materials for Civil Engr	F	F	F	F
1304	Soil Mechanics/Found		S	S	S
1309	Environmental Engr I	F	F	F	F
1310	Environmental Engr Lab	F	F	F	F
1311	SelTpcs Geotech Engr		S	S	S
1313	Steel Design		S	S	S
1317	Struct Analysis I	F	F	F	F
1320	Intro to Elec/Comp Engr	F	S	F	S
1321	Elec Cir & Machines	F	F	F	F
1322	Linear Circuits	F	F	F	F
1324	Digital Circ/Cmp Sys		S	S	S
1326	Electromech Sys		S	S	S
1327	Acoustics and Music		S	S	S
1340	Fluid Mechanics	F	F	F	F
1342	Prin of Naval Arch		S	S	S
1346	Experimental Methods	F	F	F	F
1351	Thermodynamics	F	F	F	F
1353	Thermal Systems Dsgn		S	S	S
1362	Software Design I	F	F	F	F
1366	Intro to GUI Prog		S	S	S
1370	Mechanisms		S	S	S
1395	Projects in Engr	F	S	F	S
1401	Const Proj Mgmt	F	F	F	F
1402	Civil Eng Design		S	S	S

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Course	Course Title	'08-'09	'09-'10	'10-'11	'11-'12
1404	Geotech Engr Design	F	F	F	F
1407	Enviromntl Engr II	S	S	S	S
1408	Surveying				
1411	Reinf Concrete Dsgn	F	F	F	F
1414	Struct Dsgn Extrm Events		S	S	S
1417	Structural Analysis II				
1419	Dir Studies in CE	F S	F S	F S	F S
1420	Antennas & Propagatn	F	F	F	F
1422	Communication Syst	F	F	F	F
1424	Computer Cntrl Sys	S	S	S	S
1426	Prjcts El/Cmp Engr I	F	F	F	F
1429	Digital Signal Prcss	S	S	S	S
1431	Electronic Nav Syst	S	S	S	S
1432	Computer Coms & Ntwks	S	S	S	S
1435	Intro Aerodynamics	S	S	S	S
1436	Prjcts El/Cmp Engr II	S	S	S	S
1439	Dir Studies/EE	F S	F S	F S	F S
1440	Machine Design	F	F	F	F
1442	Prin of Ship Design	F	F	F	F
1444	Ship Dsgn/Syst Intgr	S	S	S	S
1446	Mechanical Engr Dsgn	S	S	S	S
1451	Into to Seakeeping	F	F	F	F
1453	Ship Propulsion Dsgn	F	F	F	F
1455	Ship Structures	F	F	F	F
1458	Software Design II	S	S	S	S
1459	Heat Transfer	S	S	S	S
1460	Mod&Ctrl of Dyn Sys	F	F	F	F
1462	Finite Element Anlys		S	S	S
1465	Dctn Radioactive Mtl	S	S	S	S
1466	HVAC Principles	S	S	S	S
1469	Dir Studies/NA&ME	F S	F S	F S	F S
1479	Dir Studies/ME	F S	F S	F S	F S
1480	Design Project Mgt	F	F	F	F
1489	Sel.Topics in El/Cmp Engr	F S	F S	F S	F S
1491	Fund Engr Exam Review	S	S	S	S
2101	Intro College Comm	F	F	F	F
2111	Eng Comp & Speech	F S	F S	F S	F S
2121	Art of Effctv Wrtnng	F	F	F	F
2123	Writing About Literature	F S	F S	F S	F S
2125	Writing About Lit (H)	S	S	S	S
2141	Leaders in U.S. Hist	F S	F S	F S	F S
2235	Spanish I	F	F	F	F
2236	Spanish I/II	S	S	S	S

### Catalog of Courses

Course	Course Title	'08-'09	'09-'10	'10-'11	'11-'12
2237	Spanish II	S	S	S	S
2259	Prin of Amer Govt	F	F	F	F
2261	Amer Foreign Policy	S	S	S	S
2263	American Government	F S	F S	F S	F S
2283	Evaluation & Cnslng	S	S	S	S
2285	Soc Sci Resrch Methods		S	S	S
2293	Moral/Ethcl/Pol Phil	F S	F S	F S	F S
2315	Drawing I	S	S	S	S
2323	Hum/World Lit: Arts	S	S	S	S
2324	Hum/World Lit: Lat Am	F	S	S	S
2325	Hum/World Lit: Pol/Hist			S	
2331	CG Spanish	S	S	S	S
2333	Slctd Topics in Lit		S	S	S
2335	Spanish III	F	F	F	F
2336	Cnverstional Spanish	S	S	S	S
2337	Spanish IV	S	S	S	S
2338	Latin American Hist		F	F	F
2341	Europe Since 1648	S	S	S	S
2345	World War II	F	F	F	F
2349	Adv. Spanish: Intl Rltns		F		F
2351	Great European Ldrs		F	F	F
2357	Russia			S	
2360	Sel Topics in Phlsphy	S	S	S	S
2361	Western Pol Theory	S	S	S	S
2365	Comparative Politics	S	S	S	S
2367	Interntl Relations	F	F	F	F
2370	Contem. U.S. For. Policy		S	S	S
2372	Political Partcptn		F	F	F
2381	Social Psychology		F	F	F
2389	Law and the Courts	S	S	S	S
2391	Criminal Justice	F S	F S	F S	F S
2393	Moral & Ethical Phil	F S	F S	F S	F S
2395	Rhtic & CrtRm Advocacy	F S	F S	F S	F S
2399	Projects in Govt	F	F	F	F
2421	Dir Stds/Humanities	F S	F S	F S	F S
2425	Senior Honors Smnr	F S	F S	F S	F S
2429	Craft of Creative Writing		S	S	S
2439	Advanced Spanish	F	F	F	F
2441	The Civil War Era		F	F	F
2449	Dir Studies/Philosophy	F S	F S	F S	F S
2454	Amer in Nuclear Age		S	S	S
2457	Public Policymaking	F	F	F	F
2459	Dir Studies/History	F S	F S	F S	F S

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Course	Course Title	'08-'09	'09-'10	'10-'11	'11-'12
2461	American Congress	F	F	F	F
2462	Slct Tpcs in Pub Policy	F S	F S	F S	F S
2463	U.S. Maritime Hist/Pol	F	F	F	F
2465	U.S. Military Policy		S	S	S
2467	Global Plcy Studies	F	F	F	F
2469	Natl Security Policy	F	F	F	F
2470	American Pres Policy		S	S	S
2471	Area Studies	S	S	S	S
2472	Drugs Policy		S	S	S
2474	Politics of Intl Econ	TBD			
2475	Media & Am Politics	S		S	
2476	Democracy in America	S	S	S	S
2479	Dir Studies/Govt	F S	F S	F S	F S
2481	Intell & Nat Sec Pol	F S	F S	F S	F S
2483	Intell & Democracy	S	S	S	S
2487	Dir Studies/Intell	F S	F S	F S	F S
2489	Dir Studies/Psy	F S	F S	F S	F S
2493	Maritime Law Enfcmnt	F S	F S	F S	F S
2495	Adv Research Proj	F S	F S	F S	F S
2496	International Law	F	F	F	F
2497	Constit Law & H. S.	S	S	S	S
2498	Senior Thesis	F S	F S	F S	F S
2499	Dir Studies/Law	F S	F S	F S	F S
3107	Intro to Calculus	F	F	F	F
3111	Calculus I	F S	F S	F S	F S
3115	Calculus II (V)	F	F	F	F
3117	Calculus II	F S	F S	F S	F S
3211	Multivariable Calc	F S	F S	F S	F S
3213	Probability & Stat	F S	F S	F S	F S
3215	Differential Eqtns	F S	F S	F S	F S
3221	Linear Algebra	F	F	F	F
3231	Linear Optimization	S	S	S	S
3237	Discrete Mathematics	S	S	S	S
3301	Adv Engineering Math	S	S	S	S
3311	Advanced Calculus	S	S	S	S
3333	Network & Nonlin Optim	F	F	F	F
3335	Visual Basic	F	F	F	F
3336	Information Systems	S	S	S	S
3341	Probability Theory	F	F	F	F
3343	Mathematical Stats	S	S	S	S
3351	Probability Models	S	S	S	S
3417	Numerical Analysis	S	S	S	S
3441	Expl Data Analysis		F	F	F

### Catalog of Courses

Course	Course Title	'08-'09	'09-'10	'10-'11	'11-'1
3447	Linear Regression	F	F	F	F
3453	Decision Models	F	F	F	F
3463	Simulation w/Risk Anlys	F	F	F	F
3471	Operations Analysis	S	S	S	S
3477	Proj in Op Research	F	F	F	F
3478	SelTps in Op Research	F	F	F	F
3479	Dir Studies/OR	F S	F S	F S	F S
4101	Dvlmntl Swimming	F	F	F	F
4102	Prin Fitness/Well I	F	F	F	F
4103	Personal Defense I	S	S	S	S
4111	Swimming I	F S	F	F	F
4112	Prin Fitness/Well II	S	S	S	S
4204	Lifetime Sports I/RQB	F S	F S	F S	F S
4214	Lifetime Sports II: Golf	F S	F S	F S	F S
4222	Professional Rescuer	F S	F S	F S	F S
4303	Personal Defense II	F S	F S	F S	F S
4304	Lifetime SportsIII:Tennis	F S	F S	F S	F S
4400	Remdial Physic Tng	F S	F S	F S	F S
4401	Water Safety Inst	S	F S	F S	F S
4403	Martial Arts	F S	F S	F S	F S
4404	Badminton	F	F S	F S	F S
4405	Adventure Sports I:RC	F	F	F	F
4407	Dance	F S	F S	F S	F S
4409	Horseback Riding	F S	F S	F S	F S
4411	Scuba Diving	F S	F S	F S	F S
4414	Advanced Golf	F S	F S	F S	F S
4415	Adventure Sports II	S	S	S	S
4421	Advanced Scuba Diving	S	S	S	S
4425	Ropes Challenge	F	F	F	F
4434	Skiing/Snowboarding		S	S	S
4439	Theory of Coaching	F S	F S	F S	F S
4444	Indoor Recrtnl Sports	F S	F S	F S	F S
4459	Sport/Wellness Leader	F S	F S	F S	F S
4464	Strength & Cndtning	S	S	S	S
4484	Sel Topics/HPE	S	S	S	S
4499	Dir Studies/HPE	F S	F S	F S	F S
5102	Chemistry I	F	F S	F S	F S
5104	Chemistry I (Honors)	F	F	F	F
5106	Chemistry II	S	S	S	S
5108	Chemistry II (Honors)	S	S	S	S
5232	Marine Biology	F	F	F	F
5234	Marine Geochemistry	S	S	S	S
5238	Physical Oceanogrphy	S	S	S	S

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Course	Course Title	'08-'09	'09-'10	'10-'11	'11-'12
5240	Meteorology	F	F	F	F
5247	Projects in Mar Sci	F S	F S	F S	F S
5262	Physics I	F	F	F	F
5266	Physics II	S	S	S	S
5306	Physical Chemistry	F	F	F	F
5312	Analytl Methods/Chem	S	S	S	S
5330	Geospatial Sciences I	F	F	F	F
5334	Fisheries Biology	F	F	F	F
5338	Marine Forecasting	As R'qrd			
5342	Bio/Chemical Oceans	S	S	S	S
5350	Ocean Dynamics	F	F	F	F
5352	Waves and Tides	S	S	S	S
5364	Semi-conductor Phycs	S	S	S	S
5366	Astronomy	F	F	F	F
5389	Dir Studies/Physics	F S	F S	F S	F S
5402	Organic Chemistry	F	F	F	F
5415	Hazardous Materials	S	S	S	S
5417	Toxicology	S	S	S	S
5419	Biochemistry	F			
5420	Chemometrics	F			
5421	Projects in Chem	F S	F S	F S	F S
5429	Research in Chem	F S	F S	F S	F S
5430	Geospatial Sciences II	S	S	S	S
5439	Dir Studies Chem	F			
5436	Coastal Oceanography	F	F	F	F
5441	Marine Pollution	F	F	F	F
5442	Atmospherc & Mar Sci	F S	F S	F S	F S
5445	Fisheries Management	S	S	S	S
5459	Research in Mar Sci	F S	F S	F S	F S
5469	Research in Geospatial Sci	F S	F S	F S	F S
5475	Intro Geospatial Sci	S	S	S	S
5477	Optics		F	F	F
6101	Fndmntls of Navigation	F S	F S	F S	F S
6201	Ship/Mrtme Sys Knwldg	F S	F S	F S	F S
6202	Apps in Navigation Lab	F S	F S	F S	F S
6301	Maritime Watch Officer		F S	F S	F S
6316	Nautical Science III	F S			
6401	Coast Guard Div Officer	F S	F S	F S	F S
6459	SelTpcs Pro Mar Dev	S	S	S	S
6469	Proj in Pro Mar Dev	S	F S	F S	F S
6489	Dir Stds ProMarDev	F S	F S	F S	F S
8115	Macroeconomic Prin	F S	F S	F S	F S
8201	Intro to Mgmt & Bus	F S	F S	F S	F S



*Catalog of Courses*

Course	Course Title	'08-'09	'09-'10	'10-'11	'11-'12
8211	Ldrshp/Org Behavior	F S	F S	F S	F S
8217	Microeconomic Prin	F	F	F	F
8331	Management Info Sys	S	S	S	S
8246	Financial Accounting	S	S	S	S
8343	Public Sector Economics		S	S	S
8348	Managerial Accounting	F	F	F	F
8349	Financial Management	S	S	S	S
8353	Systms Analy & Desgn		F	F	F
8357	Human Resources Mgt	F	F	F	F
8358	Negt & Conflict Mgmt		F	F	F
8361	Supply Chain Mgt	S	S	S	S
8363	Ops Research & Proj Mgt	S	S	S	S
8366	Ldrshp & Orgn Dvlmnt	F S	F S	F S	F S
8413	Managerial Economics	S	S	S	S
8415	Personal Finance	F S	S	S	S
8417	Investment Theory	F S	F	F	F
8423	Management Control		F	F	F
8425	Global Bus & Econ	F			
8429	Managerial Psychology	F	S	S	S
8439	Dir Studies/Econ	S	S	S	S
8342	Marketing	S	S	S	S
8445	Public Mgmt Consult	S	S	S	S
8443	Strategic Management	F	F	F	F
8448	Sel Tpcs Fin/Acct/Ec	F S	F S	F S	F S
8449	Sel Tpcs IS/DS	F S	F S	F S	F S
8441	Legal Environ Bus	S	S	S	S
8419	Info Tchnlgy in Orgs	F	F	F	F
8450	Sel Topics in Ldrshp	S	F S	F S	F S
8458	Projects in Ldrship	F			
8459	Sel Tpcs Ldrship	F			
8468	Dir Stdy/Fin/Acct/Ec	S	S	S	S
8469	Dir Studies/Mgmt	F S	F S	F S	F S
8470	Dir Studies in IS/DS	S	S	S	S
8439	Diversity and Leadership	S	F	F	F

## **PART VI — DIRECTORY**

### ***BOARD OF TRUSTEES***

- Ronald T. Hewitt, Rear Admiral, Assistant Commandant for Human Resources (CG-1), Chair  
Charles W. “Skip” Bowen, Master Chief, Master Chief Petty Officer of the Coast Guard (CG-00B)  
Robert S. Branham, Rear Admiral, District Commander, Seventh District (CCGD7)  
Manson K. Brown, Rear Admiral, District Commander, Fourteenth District (CCGD14)  
J. Scott Burhoe, Rear Admiral, Superintendent (USCGA)  
Jan T. Riker, Rear Admiral, Director of Response Policy (CG-53)  
Terri A. Dickerson, Director, Office of Civil Rights (CG-00H)  
Daniel R. May, Rear Admiral, Director of Reserve and Training (CG-13)  
Thomas P. Ostebo, Rear Admiral, Assistant Commandant for Engineering and Logistics (CG-4)  
Ronald J. Rabago, Rear Admiral, Director of Acquisition Programs and Program Executive Officer (CG-93)  
Keith A. Taylor, Rear Admiral, Assistant Commandant for Resources, Chief Financial Officer (CG-8)  
Kevin S. Cook, Rear Admiral, Director of Prevention Policy (CG-54)  
Peter W. Melera, Chief of Military Operations, USCG Auxiliary

### ***Special Representatives***

- Robert B. Hallock, II, President and Chief Executive Officer, Chatham Model Boatworks  
Richard D. Herr, Vice Admiral, USCG, Ret.  
Richard W. Schneider, Rear Admiral, USCGR, Ret., President, Norwich University

### ***Senior Advisory Council***

- Jody A. Brackenridge, Vice Admiral, Commander, Coast Guard Pacific Area (PACAREA)  
Robert J. Papp, Jr., Vice Admiral, Commander, Coast Guard Atlantic Area (LANTAREA)  
John P. Currier, Vice Admiral, Chief of Staff (CG-01)  
Sally Brice-O’Hara, Rear Admiral, Deputy Commandant for Operations (CG-DCO)

### ***Executive Secretaries***

- Eric P. Brown, Captain, Assistant Superintendent (USCGA)

## *Catalog of Courses*

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Cameron T. Naron, Captain, Office Chief, Leadership and Professional Development (CG-133)

### *EMERITI*

#### *Distinguished Professors Emeriti*

Robert G. Boggs, Professor, Ph.D., P.E.  
Thomas D. Combs, Jr., Captain, USCG (Ret.), Ph.D.  
Irving H. King, Professor, Ph.D.  
Albert L. Lawrence, Captain, USCG (Ret., Dec.)  
Nathan L. Marvin, Professor, M.A.  
Nelson W. Nitchman, Professor, B.A.  
Ephraim P. Rivard, Captain, USCG (Ret.)  
Stanley L. Smith, Captain, USCG (Ret.), M.S.  
Roderick M. White, Captain, USCG (Ret.), Sc.D.

#### *Professors Emeriti*

G. Phillip Boeding, Professor, M.S.  
Gaston N. Buron, Professor, Ph.D. (Posthumously)  
Geoffrey A. Cardinali, Associate Professor, M.A.  
J. Richard Christman, Professor, Ph.D.  
Richard T. Close, Professor, Ph.D.  
John D. Crowley, Professor, Ph.D.  
Attilio E. DeFilippis, Associate Professor, M.A.  
Robert L. DeMichiell, Captain, USCG (Ret.), Ph.D.  
Charles Dennis, Associate Professor, M.S.  
Robert Dixon, Jr., Assistant Professor  
Joseph B. Egan, Captain, USCG (Ret.), Ph.D.  
Edwin Emery, Professor, Ph.D. (Posthumously)  
Paul F. Foye, Captain, USCG (Ret.), M.A. (Posthumously)  
Robert J. Fuller, Captain, USCG (Ret.), Ph.D.  
Bruce S. Gathy, Professor, Ph.D.  
Otto E. Graham, Captain, USCG (Ret.), B.A.  
Wayne R. Grondlund, Captain, USCG (Ret.), Ph.D.  
Thomas J. Haas, Captain, USCG (Ret.) Supervisory Professor, Ph.D.  
J. Barton Hoag, Captain, USCG (Ret.) Ph.D. (Posthumously)  
Paul H. Johnson, Associate Professor, M.A., M.A.L.S.  
Raymond A. Kambeitz, Associate Professor, M.S.  
Frank S. Kapral, Captain, USCG (Ret.), M.S.  
Leonard J. Kelly, Captain, USCG (Ret.), Ph.D.  
Ronald C. Kollmeyer, Captain, USCG (Ret.), Ph.D.  
Saul Krasner, Professor, Ph.D.  
John B. Mahon, Captain, USCG (Ret.), M.A.

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## *U. S. Coast Guard Academy*

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Philip I. Mathew, Professor, Ph.D.  
David A. McGill, Professor, Ph.D. (Posthumously)  
Jordon L. Pecile, Professor, M.A.  
Raymond J. Perry, Captain, USCG, Ph.D.  
Don C. Pinhey, Associate Professor, M.S.  
Earl H. Potter III, Captain, USCG (Ret.), Ph.D.  
Robert E. Reed-Hill, Captain, USCG (Ret.)  
Larry E. Rutledge, Associate Professor, M.S.  
David A. Sandell, Captain, USCG (Ret.), Ph.D.  
William A. Sanders, Supervisory Professor, Ph.D.  
Carl W. Selin, Captain, USCG (Ret.), Ph.D.  
Bruce C. Skinner, Captain, USCG (Ret.), Nav.E  
Richard E. Slimak, Professor, Ph.D.  
Gwendolyn R. Stevens, Professor, Ph.D.  
Douglas S. Tolderlund, Professor, Ph.D.  
David W. Weber, Professor, Ph.D.  
Sherman S. Weidenbaum, Professor, Ph.D.  
Ronald A. Wells, Captain, USCG (Ret.), Ph.D.  
Malcolm J. Williams, Captain, USPHS (Ret.), Ph.D. (Dec.)  
Joseph J. Wolcin, Professor, Ph.D.  
Jimmie D. Woods, Captain, USCG (Ret.), Ph.D.

### *ACADEMY PERSONNEL*

#### *Office of the Superintendent*

J. Scott Burhoe, Rear Admiral, USCG, Superintendent  
Eric P. Brown, Captain, USCG, Assistant Superintendent  
John Niece, Master Chief, USCG, Command Master Chief  
Sean Lester, Commander, USCG, Planning Officer  
Robert Cole, Lieutenant, Assistant Planning Officer/Superintendent's Aide  
Antonio Farias, Director, Diversity Affairs  
Bonnie Fogell, YNC (Ret.), USCG, Executive Assistant  
Institutional Research  
Leonard M. Giambra, Ph.D., Director, Institutional Research  
Erich Stein, Lieutenant Commander, USCG, Assistant Director

#### *Chaplain's Office*

W. Kyle Fauntleroy, Captain, CHC, USN, Command Chaplain  
Daniel L. Mode, Lieutenant Commander, CHC, USN, Staff Chaplain  
Lori L. Kleppe, Lieutenant, CHC, USN, Staff Chaplain  
Judy Zakutansky, Administrative Assistant

## *Catalog of Courses*

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### ***Civil Rights Office***

Kenneth Hunter, Civil Rights/EEO Officer  
Colleen Jones, Lieutenant, USCG, Equal Opportunity Advisor

### ***Legal***

Sean Gill, Commander, USCG, J.D., Legal Officer  
Michael Cavallaro, Lieutenant Commander, USCG, J.D., Principal Assistant  
Legal Officer  
Benjamin Karpinski, Lieutenant, USCG, Assistant Legal Officer

### ***Museum***

Hallie Brooker, Museum Curator

### ***Center for Counseling and Development***

Robert Murray, Ed.D., Professor, Director of Counseling, Licensed  
Psychologist

### ***ACADEMIC DIVISION***

Kurt J. Colella, Captain, USCG (Ret.), Ph.D., Professor, P.E.,  
Dean of Academics  
Richard Sanders, Captain, USCG, Ph.D., Associate Professor, Associate Dean  
(collateral)  
Evelyn Ellis, Ed.D., Associate Dean of Academic Support Services  
Anne Morrissey, Lieutenant Commander, USCG, M.B.A., Assistant  
Professor, Assistant Dean (collateral)  
Melinda D. McGurer, Commander, USCG, Ph.D., Associate Professor,  
Director, Academic Advising (collateral)  
Rita J. Smith, Administrative Assistant

### ***Registrar***

Donald E. Dykes, M.S., Registrar  
Mary J. Crevier, M.A., Associate Registrar  
Christopher White, Education Support Assistant

### ***Library***

Patricia A. Daragan, M.L.S., Director of the Library  
Richard Everett, Head, Reference and Instruction  
Lucia Maziar, Head, Library Automation and Technical Services  
Janet Essency, Technical Services Librarian  
Susan Cornacchia, Evening and Weekend Reference/Instruction Librarian  
Betty Davis, Pauline Lamarre, Cynthia Juskiewicz, Janet Whitty —  
Library Technicians

***Engineering Department***

Vincent Wilczynski, Captain, USCG, Ph.D., Professor, Department Head

*Civil Engineering Section*

Nathan Podoll, Commander, USCG, M.S., P.E., Associate Professor, Section Chief

Corinna Fleischmann, Lieutenant Commander, USCG, M.S., P.E., Assistant Professor

Hudson Jackson, Ph.D., P.E., Assistant Professor

Brian Maggi, Lieutenant, USCG, M.S., Instructor

David F. Mazurek, Ph.D., P.E., Professor

Nathan Rumsey, Lieutenant, USCG, M.B.A, Instructor

Jonathan C. Russell, Captain, USCG, Ph.D., P.E., Professor

Sharon Zelmanowitz, Ph.D., P.E., Professor

*Electrical and Computer Engineering Section*

Keith Gross, Ph.D., P.E., Professor, Section Chief

Joseph Benin, Lieutenant, USCG, M.S., P.E., Instructor

Richard J. Hartnett, Captain, USCG, Ph.D., P.E., Professor

Matthew Kempe, Lieutenant Junior Grade, USCG, M.S., Instructor

Charles Novak, Lieutenant, USCG, M.S., Instructor

Robert R. Oatman, Commander, USCG, M.S., Associate Professor

Rhett R. Rothberg, Lieutenant, USCG, M.S., Instructor

Kelly Seals, Lieutenant Commander, USCG, M.S., P.E., Assistant Professor

Terry Vogler, M.S., Lecturer

*Mechanical Engineering Section*

Carla J. Egelhoff, Ph.D., P.E., Professor, Section Chief

Ronald S. Adrezin, Ph.D., P.E., Associate Professor

David C. Clippinger, Lieutenant Commander, USCG, Ph.D., Assistant Professor

Matthew Edwards, Lieutenant Commander, USCG, P.E., Assistant Professor

Andrew Foley, Ph.D., P.E., Professor

Charles Hatfield, Commander, USCG, Associate Professor

Eben H. Phillips, Lieutenant, USCG, M.S., P.E., Instructor

Jessica Rozzi-Ochs, Lieutenant, USCG, M.S., Instructor

*Naval Architecture and Marine Engineering Section*

Todd E. Taylor, Ph.D., Associate Professor, Section Chief

Scott Calhoun, Lieutenant Commander, USCG, M.S., Assistant Professor

Michael Corl, Lieutenant Commander, USCG, Ph.D., Assistant Professor

Thomas W. DeNucci, Lieutenant Commander, USCG, M.S., Assistant Professor

Nicholas Parker, Lieutenant, USCG, M.S., Instructor

Keith A. Peterson, Ph.D, Lecturer

## *Catalog of Courses*

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William M. Simpson, Jr., Ph.D., Lecturer  
Susan Swithenbank, Ph.D., Assistant Professor  
Christopher Wolfe, Lieutenant Commander, USCG, M.S., Assistant Professor

### ***Humanities Department***

L. Anne Flammang, Captain, USCG, Ph.D., Professor, Department Head

#### *Law Section*

Glenn Sulmasy, Captain, USCG, J.D., L.L.M., Professor, Section Chief  
Russ Bowman, Lieutenant Commander, USCG, J.D., Assistant Professor  
Kevin Bruen, Commander, USCG, J.D., Associate Professor  
Andrea Logman, Lieutenant Commander, USCG, J.D., Assistant Professor

#### *English and Foreign Languages Section*

Jose B. Gonzalez, Ph.D., Professor, Section Chief  
Brian Krautler, Lieutenant Commander, USCG, M.A., Assistant Professor  
Elizabeth Rivero, Ph.D., Assistant Professor  
Alexander Waid, Ph.D., Associate Professor  
Karen A. Wink, Ph.D., Associate Professor

#### *Government/History/Ethics Section*

Brigid M. Pavilonis, Commander, USCG, M.A.L.D., Associate Professor, Section Chief  
Robert C. Ayer, Captain, USCG, Ph.D., Professor  
Timothy Balunis, Lieutenant, USCG, M.A., Instructor  
Camilla Bosanquet, Lieutenant Commander, USCG, M.A., Assistant Professor  
Antonia Gay, Lieutenant Commander, USCG, MSSI, Assistant Professor  
Christopher LaMonica, Ph.D., Assistant Professor  
Melissa Matthes, Ph.D., Assistant Professor  
Brian McSorley, Lieutenant Commander, USCG, M.A., Assistant Professor  
Dwayne Ripley, Lieutenant, USCG, MSSI, Instructor  
Michael Turner, Lieutenant Commander, USCG, M.A., Assistant Professor  
Erik Wingrove-Haugland, Ph.D., Professor  
Judith A. Youngman, Ph.D., Professor  
Richard Zuczek, Ph.D., Professor

### ***Mathematics Department***

Mark B. Case, Captain, USCG, Ph.D., Professor, Department Head  
Sam Cheung, Lieutenant, USCG, M.S., Instructor  
Ian D. Frommer, Ph.D., Assistant Professor  
David Gudbrandsen, Lieutenant Commander, USCG, M.S., Assistant Professor  
Eric C. Johnson, Ph.D., Associate Professor  
Katherine B. Krystinik, Ph.D., Professor  
Melinda D. McGurer, Commander, USCG, Ph.D., Associate Professor

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## *U. S. Coast Guard Academy*

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Janet A. McLeavey, Ph.D., Professor  
Maurice D. Murphy, Lieutenant, USCG, M.S., Instructor  
Russell A. Rushmeier, Ph.D., Assistant Professor  
Kurt A. Sebastian, Commander, USCG, Ph.D., Associate Professor  
Jamie J. Smith, Lieutenant, USCG, M.S., Instructor  
Meghan K. Steinhaus, Lieutenant, USCG, M.S., Instructor

### ***Science Department***

Glenn S. Frysjinger, Ph.D., Professor, Department Head

#### *Chemistry Section*

Gregory J. Hall, Lieutenant Commander, USCG, Ph.D., Assistant Professor,  
Section Chief  
Joseph D. Brown, Lieutenant Commander, USCG, M.S., Assistant Professor  
Richard B. Gaines, Captain, USCG, Ph.D., Professor  
Tiffany St. George, Lieutenant Commander, USCG, M.S., Assistant Professor  
Joshua Gray, Ph.D., Assistant Professor  
Margaret Kennedy, Lieutenant, USCG, M.S., Instructor  
Richard W. Sanders, Captain, USCG, Ph.D., Professor

#### *Marine Science Section*

Karina L. Mrakovcich, Ph.D., Associate Professor, Section Chief  
Michael A. Alfultis, Captain, USCG, Ph.D., Professor  
Deanna L. Bergondo, Ph.D., Assistant Professor  
Charlene Fogue, Lieutenant, USCG, M.S., Instructor  
Victoria Futch, Lieutenant, USCG, M.S., Instructor  
Sam C. Wainright, Ph.D., Professor

#### *Physics Section*

Richard N. Paolino, Ph.D., Professor, Section Chief  
Lorraine A. Allen, Ph.D., Associate Professor  
Royce W. James, Lieutenant, USCG, M.S., Instructor  
Kirk D. Johnson, Commander, USCG, M.S., Associate Professor  
Jennifer Konon, Lieutenant, USCG, M.S., Instructor  
Brooke S. Stutzman, Ph.D., Associate Professor  
Richard Walsh, Lieutenant, USCG, M.S., Instructor

### ***Management Department***

Paul S. Szwed, Captain, D.Sc., Professor, Department Head  
Jeffery Brewer, Lieutenant, M.B.A., Instructor  
Laurel R. Goulet, Ph.D., Professor  
Jadon E. Klopson, Lieutenant Commander, USCG, M.S., Assistant Professor  
Douglas MacKenzie, Ph.D., Lecturer  
Carol J. McNair, Ph.D., Professor  
Anne M. Morrissey, Lieutenant Commander, USCG, M.B.A., Assistant  
Professor



## *Catalog of Courses*

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Michael H. Schuster, Ph.D., Professor  
Darell D. Singleterry, Commander, USCG, M.B.A., Associate Professor  
John B. White, Ph.D., Professor  
Alina M. Zapalska, Ph.D., Professor

### *Health and Physical Education Department*

Daniel Rose, M.Ed., Department Head, Track and Field (Indoor/Outdoor)  
(Men and Women)  
Peter K. Barry, M.A., Professional Faculty, Head Basketball Coach (Men)  
Ethan Brown, M.Ed. Assistant Track and Field Coach (Indoor/Outdoor) (Men  
and Women)  
Stephen Eldridge, M.S., Associate Professor, Head Wrestling and Head Cross  
Country Coach (Men)  
Dana R. Fleischmann, M.S, Professional Faculty, Assistant Football Coach  
and Director of Intramurals  
Bill George, M.S., Professional Faculty, Head Football Coach  
Susan Grant, Soccer Coach (Women)  
Ulysses C. Grant, M.S., Professional Faculty, Head Baseball Coach and As-  
sistant Football Coach  
Barry H. Hurst, B.S., USN Ret., Aquatics Instructor (OCS, LDC)  
Donna Koczajowski, M.S., Professional Faculty, Head Softball Coach  
Raymond LaForte, M.S., Professional Faculty, Assistant Football and Assis-  
tant Track and Field Coach  
Chris Parsons, M.S., Professional Faculty, Head Soccer Coach (Men)  
John P. Westkott, M.S., Professional Faculty, Head Swimming Coach (Men  
and Women)  
Mary Westkott, M.S., Professional Faculty, Assistant Swimming Coach (Men  
and Women)

### *ADMISSIONS DIVISION*

Susan Bibeau, Captain, USCG, M.S., Director of Admissions  
Patricia Soares, M.A., Associate Director of Admissions  
Sheryl Miner, Secretary

### *Recruiting*

Octavia Poole, Lieutenant Commander, USCG, M.A., Associate Director of  
Admissions for Recruiting  
Caroline Bladen, Lieutenant Junior Grade, USCG, B.S., Assistant Director for  
Campus Programs  
Meghan Hague, Lieutenant Junior Grade, USCG, B.S., Admissions Officer  
Aaron Parker, Lieutenant Junior Grade, USCG, B.S., Admissions Officer  
Daniel Sporer, Lieutenant, USCG, B.S., Admissions Officer  
Brandi Schott, A.D., Recruiting Support Staff

### ***Diversity and Outreach***

Vacant, Associate Director of Admissions for Diversity and Outreach  
Meghan Brunaugh, Lieutenant, USCG, B.S., Admissions Officer  
Laseanta Stafford, Lieutenant, USCG, B.S., Admissions Officer

### ***Marketing***

Leo Gonot, M.S., Associate Director of Admissions for Marketing  
Bill Bauer, A.D., Marketing Support Staff  
Leann Strickland, B.A., Web Information Director

### ***Operations***

Chris McMunn, M.S., Associate Director of Admissions for Operations  
Donna Homiski, Operations Support Supervisor  
Brad Beckwith, Operations Support Staff  
Kathy Lyons, Operations Support Staff

### ***Volunteer Programs***

Tamara McKenna, M.B.A., Associate Director of Admissions for Volunteer Programs  
Jeff Creighton, Volunteer Programs Support Staff  
Patty Giannattasio, B.A., Volunteer Programs Support Staff

### ***ATHLETICS DIVISION***

Raymond Cieplik, Ph.D., Professor, Director of Athletics  
Peter K. Barry, M.A., Professional Faculty, Head Basketball Coach (Men)  
Robert Bono, Basketball Coach (Associate)  
Ethan Brown, M.S., Professional Faculty, Assistant Track and Field Coach,  
Head Women's Cross Country  
Bruce Cobb, Athletic Equipment Room Manager  
Steve Eldridge, M.S., Associate Professor, Head Wrestling and Head Cross  
Country Coach (Men)  
Jeremy Fields, A.T.C., Athletic Trainer  
Jack Flaherty, Equipment Room Staff  
Dana R. Fleischmann, M.S., Professional Faculty, Assistant Football Coach  
and Director of Intramurals  
Richard Gaines, Captain, USCG, Ph.D., Head Basketball Coach (Women)  
Bill George, M.S., Professional Faculty, Head Football Coach  
Susan Grant, M.S., Head Soccer Coach (Women)  
Ulysses C. Grant, M.S., Professional Faculty, Head Baseball Coach, Assis-  
tant Football Coach  
Marc Grindstaff, Equipment Room Staff  
Steve Hargis, B.S., Head Crew/Rowing Coach  
James Hazlin, B.S., Head Tennis Coach

## *Catalog of Courses*

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Donna Koczajowski, M.S., Professional Faculty, Head Softball Coach  
Raymond Laforte, M.S., Professional Faculty, Assistant Football Coach  
Art Lamoureux, B.S., Athletic Operations Director  
Michael E. McKaughan, Ph.D, Academic Faculty, Head Rifle Coach  
Jennifer Meuse, Head Crew Coach (Women)  
Anne Millovitsch, A.T.C., Athletic Trainer  
Robert Mullowney, M.S., Head Volleyball Coach (Women)  
Ken Niedzwiecki, A.T.C., Head Athletic Trainer  
Viola Oliver, Secretary Billard Hall  
Tami Osterhout, M.S., A.T.C., Athletic Trainer  
Chris Parsons, M.S., Professional Faculty, Head Soccer Coach (Men)  
Jeremy Rice, M.S., A.T.C., Athletic Trainer  
Daniel Rose, M.S., Professional Faculty, Head, Department of Health and  
Physical Education, Track (Indoor/Outdoor) (Men and Women)  
Jason S. Southard, B.S., Sports Information Director  
Andrea Stewart, Director of Office Operations, Senior Woman Administrator  
John P. Westkott, M.S., Professional Faculty, Head Swimming Coach (Men  
and Women)  
Mary Westkott, M.S., Professional Faculty, Assistant Swimming Coach (Men  
and Women)

### *CADET DIVISION*

John Fitzgerald, Captain, USCG, M.S., Commandant of Cadets  
Christine Rose, Administrative Assistant

### *Cadet Branch*

Christina Davidson, Commander, USCG, M.S., Assistant Commandant of  
Cadets  
Jamie Amon, Lieutenant, USCG, B.S., Cadet Activities/Regimental Officer  
Tim Margita, Lieutenant, USCG, M.S., Alfa Company Officer  
David Bradley, Lieutenant Commander, USCG, M.S., Bravo Company Officer  
Michael Newell, USCG, M.S., Charlie Company Officer  
Allison Dussault, Lieutenant, USCG, M.S., Delta Company Officer  
Kathy Felger, Lieutenant Commander, USCG, M.S. Echo Company Officer  
Valerie Boyd, Lieutenant, USCG, M.S., Foxtrot Company Officer  
Kristina Dell'Orco, Lieutenant Commander, USCG, B.S., Golf Company Officer  
Benjamin Spector, Lieutenant, USCG, M.S., Hotel Company Officer  
Anthony McDade, Chief Petty Officer, USCG, Alpha Company Chief  
Michael Pipech, Chief Petty Officer, USCG, Bravo Company Chief  
Gilbert Page, Chief Petty Officer, USCG, Charlie Company Chief  
William Martin, Chief Petty Officer, USCG, Delta Company Chief  
Richard Harris, Chief Petty Officer, USCG, Echo Company Chief  
William Anderson, Chief Petty Officer, USCG, Foxtrot Company Chief  
Peter MacDougall, Senior Chief Petty Officer, Golf Company Chief

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## *U. S. Coast Guard Academy*

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Virginia Yoder, Senior Chief Petty Officer, Hotel Company Chief

### *Cadet Activities*

Robert G. Newton, Ph.D., Assistant Professor, Director, Cadet Vocal Activities  
Kirk Edwards, Chief Warrant Officer, Director, Cadet Bands  
Margaret J. Bowen, Director, Cadet Social Activities  
Carey McNeil, Director, Cadet Activities  
Steve Loyd, Chase Hall Building Manager

### *Cadet Professional Maritime Studies*

William Meese, Captain, USCG, M.A., Chief, Professional Maritime Studies Branch  
Jerry Smith, Lieutenant, USCG, B.A., PMS I Course Coordinator  
Ashley Crouch, Lieutenant, USCG, B.S., PMS I Instructor  
John Wright, Chief Boatswains Mate, USCG, PMS I Instructor  
Michael Keyser, Lieutenant, USCG, PMS II Course Coordinator  
Timothy Burbidge, Lieutenant, USN, B.A., PMS II Instructor  
Nicole Tesonero, Lieutenant, USCG, B.S., PMS II Instructor  
Bradley Brunaugh, Lieutenant, USCG, B.S., PMS III Course Coordinator  
Kjell Rommerdahl, Lieutenant, USCG, B.S., PMS III Instructor  
Nicholas Seniuk, Lieutenant, USCG, B.S., PMS III Instructor  
John McTamney, Lieutenant, USCG, B.S., PMS IV Course Coordinator  
Craig Allen, Lieutenant, USCG, B.S., PMS IV Instructor  
Ryan Waitt, Lieutenant, USCG, B.S., PMS IV Instructor  
James Hopkins, Electronics Technician First Class, USCG, SCANTS Maintenance

### *Cadet Training*

Andrea M. Marcille, Commander, USCG, M.S., Cadet Training Officer  
Gregory Rothrock, Lieutenant Commander, USCG, M.S., Training Officer for Character Development  
Matthew Baker, Lieutenant, USCG, M.S., GOLD Officer  
John Berkshire, Lieutenant, USCG, B.S., Training Officer for Career Development  
Stacey Dawson, Lieutenant Junior Grade, USCG, B.S., Training Coordinator  
Chad Barber, Chief Warrant Gunner, USCG, Armory Officer  
Jamie Wilson, Chief Warrant Personnel Officer, USCG, Chief, Cadet Administration

### *Waterfront*

Allen L. Kruger, II, Chief, Sailing and Seamanship  
Douglas Clark, Director of Sailing  
Hartley Kelly, Sail Training Instructor

## *Catalog of Courses*

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Mark Zagol, Inter-Collegiate Coach  
Jack Neades, Offshore Coach  
Brian Swingly, Assistant Sailing Coach  
York Bergin-Pugh, Assistant Sailing Coach  
Samantha Egger, Financial Assistant  
Charles Olsen, Maintenance Scheduler  
John Teeson, Maintenance Scheduler  
Peter Fenn, Maintenance Scheduler  
Bobby Troupe, Machinery Technician First Class, USCG  
Victor Carter, Electricians Mate, First Class, USCG  
Kenneth Corey, Marine Maintenance Technician  
Jack Grady, Marine Maintenance Technician  
James Hartley, Marine Maintenance Technician  
Steven Lemay, Marine Maintenance Technician  
Richard Locker, Marine Maintenance Technician  
Robert Rogers, Marine Maintenance Technician

### ***INFORMATION SERVICES DIVISION***

Andrew Sorenson, Commander, USCG, M.S., Chief Information Officer  
Support Branch  
Karen A Smith, B.S., Deputy Chief Information Officer  
Administrative Systems Branch  
Jason Warren, Lieutenant, USCG, B.S., Branch Chief  
Communications Branch  
Guy O. Cranfill, Information Systems Technician Senior Chief, USCG, Branch  
Chief

### ***FACILITIES ENGINEERING DIVISION***

G. Scott Gesele, Commander, USCG, M.S., P.E., Division Chief

#### ***Construction and Engineering Branch***

Gregory J. Carabine, M.S., C.F.M., Chief, Construction and Engineering Branch

#### ***Public Works Branch***

Dianna Bo, Lieutenant Commander, USCG, M.S., P.E., Public Works Officer

#### ***Environmental and Safety Branch***

Mark Buck, P.E., Chief, Environmental and Safety Branch

### ***HEALTH, SAFETY, AND WORK LIFE FIELD OFFICE***

Marc A. Getka, Captain, USPHS, MD, Field Office Director, Family Practice,  
Aviation Medical Officer  
Randolph Coffey, Captain, USPHS, Senior Dental Officer  
Richard Hedlund, Captain, USPHS, Psychiatrist

*U. S. Coast Guard Academy*

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Josiephina Souza, Captain, USPHS, Flight Surgeon  
Richard Shumway, Commander, USPHS, Physical Therapist  
Robert Dvorak, Commander, USPHS, Dental Officer  
Joseph Perez, Commander, USPHS, Family Practice, Flight Surgeon  
James Czarzasty, Lieutenant Commander, USPHS, Pharmacy Officer  
Charles Truncale, Lieutenant Commander, Dental Officer  
Jason Ramsdell, Lieutenant Commander, Physician Assistant  
Charlene Criss, Lieutenant, Physician Assistant  
Leah Mooney, Lieutenant, Group Practice Manager

***ALUMNI ASSOCIATION***

James A. Sylvester, Commander, USCG (Ret.), M.B.A., President  
John C. Maxham, Captain, USCG (Ret.), Nav.E, M.S.M.E., Vice President for  
Development

## ACADEMIC STATISTICS

### *CLASS OF 2009 STATISTICS*

Sworn In	307
Graduated	225
Commissioned	223
Men Graduated	163
Women Graduated	62
International Cadets	3
Graduated with High Honors	50
Graduated with Honors	59

#### **Majors (8)**

Civil Engineering	36
Electrical Engineering	20
Mechanical Engineering	17
Naval Architecture and Marine Engineering	18
Government	49
Operations Research and Computer Analysis	26
Marine and Environmental Sciences	29
Management	27
Double Majors:	
Operations Research and Computer Analysis/Government	1
Operations Research and Computer Analysis/ Electrical Engineering	1
Electrical Engineering/ Operations Research and Computer Analysis	1

#### Graduation Speaker:

Secretary, Department of Homeland Security, Janet Napolitano

# NOTES