Academic Catalog
2024-2025

The Academic Catalog

The Academic Catalog contains information about the Coast Guard Academy's academic requirements and programs, including Core Curriculum requirements and requirements for specific majors and certificate programs.

Cadets should be aware that they are governed by the academic requirements published in the Catalog issued during the academic year in which they matriculated at the Academy and any modifications made thereafter. Your academic advisor or the Registrar's Office can assist you in determining precisely what requirements apply to you.

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About the United States Coast Guard Academy

The United States Coast Guard Academy at New London, Connecticut, is one of the five United States Federal Service Academies offering undergraduate education. It is supported by the Federal Government and operated within the authority of the Department of Homeland Security. Because of this, it is the intellectual powerhouse for the Department of Homeland Security and the principal source of graduates with technical degrees for the United States Coast Guard officer corps. The four years that cadets spend at the Coast Guard Academy build a fundamental foundation of leadership development and intellectual growth. Graduates earn a Bachelor of Science and are commissioned as Ensigns in the United States Coast Guard thus beginning their service to the nation and humanity in the nation's oldest continuous seagoing service.

Mission

To graduate young men and women with sound bodies, stout hearts and alert minds, with a liking for the sea and its lore, with that high sense of honor, loyalty and obedience which goes with trained initiative and leadership; well-grounded in seamanship, the sciences and 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 and Shared Learning Outcomes

The Coast Guard Academy is dedicated to producing officers who meet the needs of the Service. Within this broad perspective lie four primary objectives:

- To provide, by precept and example, an environment that embraces the Coast Guard Core Values of Honor, Respect, and Devotion to Duty.
- To provide a sound undergraduate education in a field of interest to the Coast Guard.
- To provide leadership education.
- To provide professional training which enables graduates to immediately assume their duties as junior officers.

To ensure that the Academy produces graduates who demonstrate the required behaviors and leadership competencies, the faculty, staff and military personnel of the Coast Guard Academy have endorsed the following **Shared Learning Outcomes**. 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.

Leadership Abilities

Graduates shall be Leaders of Character who understand and apply sound leadership principles and competencies. This includes the ability to direct, develop, and evaluate diverse groups; to 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 respect for the Coast Guard's 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 differing 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.

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 their way of life so that it becomes the foundation on which to base interactions with all people, both in the Coast Guard and in society as a whole.

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 authentic 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 REVERE 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 potentially result in disenrollment from the Academy.

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.
1941 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.
1953 The Academy was accredited by the New England Association of Schools and Colleges (NEASC).
1966 First African American and Native American Academy graduates.
1973 Electrical, Marine, and Ocean Engineering programs were accredited by ECPD.
1976 Women were first admitted to the Academy.
1978 The Civil Engineering program was accredited by the Engineers' Council for Professional Development (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.
2005 The Academy and its Management degree program received initial accreditation by AACSB International – the Association to Advance Collegiate Schools of Business.
2018 NEASC becomes the New England Commission of Higher Education (NECHE).
2021 The Academy installs its first Provost.

2021 The Geospatial Intelligence Certificate Program is accredited by the United States Geospatial Intelligence Foundation (USGIF)
2023 The Marine and Environmental Sciences program was accredited by ABET.

Disclosure of Information

The Privacy Act of 1974 provides individuals with 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.

Critical Dates Calendar

Event	2024-2025	2025-2026*	2026-2027*	2027-2028*
Intersessional Period Begins	10-Jun	9-Jun	8-Jun	7-Jun
4th Class Swearing-In Day	1-Jul	30-Jun	29-Jun	28-Jun
Intersessional Period Ends	9-Aug	8-Aug	7-Aug	6-Aug
Summer Training Program Ends	17-Aug	16-Aug	15-Aug	14-Aug
Cadet Admin Processing (CAP)	19-23 Aug	18-22 Aug	17-21 Aug	16-20 Aug
Convocation	22-Aug	21-Aug	20-Aug	19-Aug
Class Start-Fall Semester	26-Aug	25-Aug	24-Aug	23-Aug
Labor Day	2-Sep	1-Sep	7-Sep	6-Sep
Parents' Weekend	27-29 Sep	19-21 Sep	18-20 Sep	17-19 Sep
Homecoming	19-Oct	18-Oct	17-Oct	16-Oct
Columbus Day/Indigenous Peoples Day	14-Oct	13-Oct	12-Oct	11-Oct
Wetmore Ethics Forum	6-Nov	5-Nov	4-Nov	3-Nov
Veterans' Day	11-Nov	11-Nov	11-Nov	11-Nov
Thanksgiving Leave	23 Nov- 1 Dec	22-30 Nov	21-29 Nov	20-28 Nov
Last Class Day-Fall Semester	11-Dec	10-Dec	9-Dec	8-Dec
Study/Conference Day-Fall Semester	12-Dec	11-Dec	10-Dec	9-Dec
Exam Period-Fall Semester	13-19 Dec	12-18 Dec	11-17 Dec	10-16 Dec
Winter Leave	20 Dec -5 Jan	19 Dec - 4 Jan	18 Dec - 03 Jan	17 Dec - 2 Jan
Final Grades Due-Fall Semester	24-Dec	23-Dec	22-Dec	21-Dec
Mid-Year Admin Processing	6-10 Jan	5-9 Jan	4-8 Jan	3-7 Jan
Class Start-Spring Semester	13-Jan	12-Jan	11-Jan	10-Jan
Martin L. King, Jr. Day	20-Jan	19-Jan	18-Jan	17-Jan
Presidents' Day	17-Feb	16-Feb	15-Feb	21-Feb
Spring Leave	8-16 Mar	7-15 Mar	06-14 Mar	4-12 Mar
Last Class Day-Spring Semester	30-Apr	29-Apr	28-Apr	26-Apr
Undergraduate Research Symposium Day	1-May	30-Apr	29-Apr	27-Apr
Study/Conference Day-Spring Semester	2-May	1-May	30-Apr	28-Apr
Exam Period-Spring Semester	3-9 May	2-8 May	1-7 May	29 Apr-5 May
Summer Training Program Begins	10-May	9-May	8-May	6-May
Final Grades Due-Spring Semester	13-May	12-May	11-May	9-May
Graduation	21-May	20-May	19-May	17-May
Summer Academic Terms	12 May-25 Jul	11 May-24 Jul	10 May-23 Jul	8 May-21 Jul

***All out-year dates are for planning purposes and subject to change.**

Organization

Academy personnel and facilities are organized into the rigorous and supportive learning environment needed by cadets for their intellectual, professional, physical, and values-based development. The Academic Division, Cadet Division, and Athletics Division develop and provide the core programs that define those functions and activities needed to execute the Academy's mission and achieve the institution's strategic goals. Coast Guard Headquarters, the Board of Trustees, the Board of Visitors, the Superintendent's Office, Admissions, Mission Support, and Health Services all collaborate to provide critical direction and support. These organizations and their resources form an Academy community that provides a rich and rewarding learning experience.

Board of Trustees

The Board of Trustees (BOT) has cognizance of all programs at the Coast Guard Academy. The BOT provides guidance and advice to the Superintendent and the chain of command up to the Commandant of the Coast Guard in the following areas:

- Review and validate the Academy's vision, mission statements and strategic plan.
- Provide general oversight and advice on issues associated with the well-being and safety of the faculty, students, and staff.
- Review, validate, prioritize, and advocate resource needs.
- Ensure that good management practices are followed.
- Ensure proper oversight of and participation in Coast Guard Academy institutional, programmatic, and course-level accreditation evaluations.
- Ensure that the Academy's academic, professional, and training curricula consist with and support the Commandant's Strategic Guidance for the Coast Guard Academy.
- Provide general oversight and advice on issues associated with strategy and alignment, as well as providing guidance to and acting as a sounding board for the Superintendent.
- Coordinate development efforts with the Coast Guard Foundation, the Alumni Association, and the Board of Visitors.
- Advocate for the Academy.

Board of Visitors

The Academy has a legislatively established Board of Visitors (BOV) that provides congressional oversight of the Academy which facilitates the Academy's relationship with key policymakers. The BOV is a 16-member board with 10 members coming from Congress and 6 at-large members designated by the President.

Academic Division

Provost and Chief Academic Officer: Dr. Amy Donahue
Vice Provost for Academic Administration: CAPT Anna Hickey
Vice Provost for Academic Affairs: Dr. Eric Page
Vice Provost for Research: CAPT Greg Hall

The Academic Division, headed by the Provost and Chief Academic Officer, consists of the School of Engineering and Cyber Systems; the School of Science, Mathematics, and the Humanities; the School of Leadership and Management; the Office of Student Success and Faculty Development; and the Office of Scholarship, Research, and Innovation. The Division offers nine academic majors: Civil Engineering, Cyber Systems, Electrical Engineering, Government, Management, Marine and Environmental Sciences, Mechanical Engineering, Naval Architecture and Marine Engineering, and Operations Research and Data Analytics. Offices and academic departments are staffed through the appointment of permanent and time-limited 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 desire for continuous self-improvement, with a commitment to service and ethical practice. The Division accomplishes this in several ways.

- Challenging classroom and laboratory experiences that promote intellectual growth.
- 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 of value to the Coast Guard.
- Presents a curriculum that positions our students for acceptance into the finest graduate schools.
- Provides intellectual resources through partnerships responsive to the Commandant's direction.

Governance

Provost's Council

The Provost's Council comprises the leaders of the Academic Division. The purpose of the Provost's Council as a body is to advance the educational and scholarly missions of the Academy through strategic thinking, action planning, communication, and collaboration. As one of several mechanisms of shared governance, the Provost's Council provides input, feedback, advice, and recommendations to the Provost to inform strategy, plans, and decisions related to the full range of Academic missions and activities, and particularly in support of faculty and student success. As the leadership of the Academic Division, the Provost's Council oversees activities as directed by the Provost, including actions related to the planning, coordination, and evaluation of academic programs; support of student recruitment, retention, learning, and success; facilitation of advising and graduation procedures; selection, retention, promotion, and development of faculty and academic staff; planning and management of resources and facilities; and academic policies and procedures. Individual Council members serve as key advisors to the Provost on strategic matters, oversee their respective areas of responsibility, enable collaboration and coordination amongst academic units, and facilitate communication between the faculty and the Provost.

Faculty Senate

The Faculty Senate is a representative body of the U.S. Coast Guard Academy's faculty, and includes civilian, permanent military, and rotating military faculty members from all three schools and Health and Physical Education. It is deliberative in nature, designed to surface and address interests, opportunities, and concerns through collaborative engagement within the faculty and between the faculty, other Divisions, and Academy leaders. The Senate advises the Provost on academic matters. Such matters may include, but are not limited to, Academic Division policies and procedures, expectations with respect to critical job elements, searches and assignments in the Academic Division, human resource practices, capital and resource allocation strategies, and enrollment management approaches. The Senate's core mission is to ensure the effectiveness of the Academy's academic programs, including stewardship of the Academy's educational curriculum, teaching, and learning practices.

Curriculum Committee

The Curriculum Committee's primary responsibility is to provide advice on curricular issues to the Provost and the Provost's Council. The Committee reviews and comments on the proposed changes to courses and discusses and promotes the curricular philosophy and structure of the Coast Guard Academy.

4/c Course Coordinators Committee

The 4/c Course Coordinators Committee is primarily concerned with the academic success of fourth-class cadets during their first year at the Academy. The committee is composed of all course coordinators of courses whose primary enrollment are 4/c cadets, as well as representatives from the Writing Center, the Library, Academic Support Services, and Cadet Division.

School of Engineering and Cyber Systems

Dean: PROF Sharon Zelmanowitz, PhD, PE
Associate Dean for Administration: LCDR Kevin Stevens, PMP
Associate Dean for Admission and Recruiting: LCDR Matthew Stroebel

The School of Engineering and Cyber Systems is a community of students, faculty, and staff who share a passion for humanitarian service through innovation as engineers and cyber professionals. Our engineering and cyber systems graduates provide essential expertise to the Coast Guard as we address unprecedented 21st century challenges that have national and global relevance. Our graduates have succeeded in many career paths and excel in a wide variety of graduate programs. Our School's fourth-class year focuses on community building, academic success, and an introduction to the many exciting opportunities awaiting our graduates. A common fourth-class curriculum allows for exploration of the five majors within our School. Students complete a broad-based core curriculum, fundamental STEM classes, and a suite of major-specific requirements that culminate in a capstone experience involving a design and/or research project for the Coast Guard or other strategic partners. Students have access to a variety of summer internships, research projects, field trips, and CG summer training. We are a small student-focused school with a military and civilian faculty who bring an ideal blend of Coast Guard field experience, industry/government practice, scholarly credentials, and expertise in undergraduate engineering education. In addition to academic credentials, many faculty members are licensed Professional Engineers (P.E.) or hold other professional credentials. Engineering students sit for the Fundamentals of Engineering examination in their first-class year; the first step toward earning a P.E. license. All of our school's academic programs are accredited by ABET. The School of Engineering and Cyber Systems is committed to fostering a welcoming and supportive environment for our students, faculty and staff.

The Mission of the School of Engineering and Cyber Systems is:

To develop technically and ethically competent engineers and cyber systems majors who as leaders excel academically, succeed professionally, and positively respond to the needs of multidisciplinary communities within New London, the Coast Guard, and the Department of Homeland Security.

Once commissioned in the Service, School of Engineering and Cyber Systems graduates go on to assignments in every area of the Coast Guard. Engineers are preferred for filling many jobs in the Coast Guard and there are many positions assigned exclusively to officers with engineering backgrounds. In fact, engineering graduates are eligible for every assignment in the Service. Cyber Systems graduates can join the growing Cyber officer specialty created to meet the cyber needs of the organization and support the Coast Guard's Cyber Strategy. 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.

The School of Engineering and Cyber Systems consists of the following departments:

- Department of Civil and Environmental Engineering
- Department of Electrical Engineering and Computing
- Department of Mechanical Engineering
- Department of Naval Architecture and Marine Engineering

Department of Civil and Environmental Engineering

Department Head: CAPT Brian Maggi, PhD, PE

The Department of Civil and Environmental Engineering has a robust tradition of preparing graduates to serve in the U.S. Coast Guard and the civil engineering industry The title Civil and Environmental Engineering (CEE) reflects the program's offerings and expertise in the environmental aspects of civil engineering. Graduates progress through a strong, intensive four-year curriculum to understand civil and environmental engineering principles and acquire the technical expertise and critical thinking skills needed for infrastructure planning, design, construction, and management. The department has supplied the Coast Guard's Civil Engineering community with the talent to support Coast Guard operations through lifecycle management, stewardship of shore infrastructure, and environmental compliance. Civil engineers provide technical and logistic support to acquire, maintain, alter, refurbish, and dispose of shore facilities to enable Coast Guard mission execution and operations in support of public safety and homeland security. Civil engineers plan, design, acquire, contract, construct,

and maintain shore facilities. Civil engineers also design systems to prevent and remediate contamination of the environment. With aging shore infrastructure and increasingly frequent extreme weather events that damage this infrastructure and cause flooding, the responsibility and the workload for a Coast Guard civil engineer is emergent and vital to Coast Guard mission success. Civil engineer graduates are often assigned to Civil Engineering Units or to facility engineering positions at larger Coast Guard bases where they design and maintain critical infrastructure.

Cadets learn and work with outstanding and highly accomplished faculty in the department. CEE faculty use their education and professional experience to guide students through the various subfields of civil engineering and mentor them to complete practical capstone project experience. CEE students are prepared to qualify as pilots for Short Range Unmanned Aircraft Systems (SR-UAS) to conduct remote inspections, perform shore infrastructure and coastal resiliency assessments, reinforce structures to resist extreme conditions; and can be confident to conduct damage assessment in the wake of environmental disasters. CEE graduates may command ships, fly aircraft, and command shore units. Based on the broad undergraduate education, CEE graduates can pursue a wide range of professions beyond the Coast Guard. Our graduates have amazing careers both while serving in the Coast Guard and the civil engineering industry. With an ABET, http://www.abet.org, accredited civil engineering degree, professional engineering licensure, and the leadership skills developed in the Coast Guard, all CEE graduates are highly sought in the fields of structural, environmental, geotechnical, water resources, transportation, and construction project management.

Department of Electrical Engineering and Computing

Department Head (acting): LCDR Jennifer Rogers, PhD

Our modern world relies upon increasingly complex technological and computer-based systems. Today's Coast Guard is no different, and every day, officers who graduated as Electrical Engineering and Cyber Systems majors are asked to answer the challenges of leveraging cutting-edge technology to enhance operational mission effectiveness in this rapidly evolving landscape for our Coast Guard. The Department of Electrical Engineering and Computing is a community of students, staff, and faculty, dedicated to developing future leaders for our Coast Guard who have the technical knowledge and mindset necessary to leverage technology to solve many of the Coast Guard's present and future operational needs. As cybersecurity has evolved, its inextricable link with electrical engineering has become apparent through the cyber-physical systems specialty area. The Department of Electrical Engineering and Computing is well situated to develop confident and competent officers operating at the intersection of these two disciplines, as well as officers with a more traditional focus in either computing or electrical engineering. In the Electrical Engineering program, cadets study a wide range of relevant topics including communications, signal processing, robotics, autonomy, power systems, and energy. Cadet research, including a year-long design project, leads students to additional study in areas such as antenna design, circuits, controls, machine learning, RF propagation, electronic navigation, and software design. Cadet projects have provided intellectual contributions to our current Rescue 21 safety of life at sea system and have contributed to our body of knowledge about GPS-spoofing countermeasures. In other senior projects, our students have designed and built autonomous sailing and motor-powered vessels, control systems for autonomous aerial vehicles, and hybrid energy solutions. In the Cyber Systems program, cadets learn the fundamentals of computing as well as cutting-edge network and computer security technologies. Program coursework includes cryptography, software engineering, computer network security, industrial control systems, databases, and operating systems. This course sequence prepares students for a year-long advanced research project. Cadet projects have included: spoofing of maritime AIS signals, creation of a maritime industrial control systems testbed, analysis of cyber-physical attacks on the power grid, and the use of machine learning for maritime VHF voice-to-text transcription.

Cadets can engage in a wide variety of summer internships at labs such as MIT Lincoln Labs, Lawrence Livermore National Lab, Sandia National Labs, Idaho National Labs, Microsoft, Lockheed Martin, and the National Security Agency. Graduates from the Electrical Engineering and Cyber Systems programs go on to serve in a wide variety of career paths as officers in the Coast Guard, from flying helicopters during challenging search-and-rescue operations to defending our nation's critical networks against our adversaries in cyberspace.

Department of Mechanical Engineering

Department Head: PROF Ron Adrezin, PhD, PE

The Department of Mechanical Engineering prepares students for the broadest area of engineering practice. The program is based on a cycle of design, build, and test. Students may enter with no experience, but they leave proficient in Computer Aided Design and machining of metals. Students' education is supported by hands on skills to help them accomplish their goals. They will bend sheet metal, tap a hole, and 3D print. They will develop mechatronic systems driven by a microcontroller. They will disassemble and reassemble a small combustion engine. They will design, analyze, and animate machine elements.

Our Mechanical Engineering faculty have over 100 years of professional engineering experience designing aerospace systems, satellites, rockets, helicopters, space suits, and jet engines. They have experience in clean energy, plant design, medical devices to help premature infants, and systems to evaluate people with rare disorders. They have served as the Engineering Officers on Coast Guard cutters, inspected commercial ships for safety, conducted rescues from the air and commanded the International Space Station. They mentor our students in critical capstone projects which have real world impact. Past Capstone Projects include aerial drones used to sample for illegally discharged oil, undersea vessels to clean hulls, systems to provide clean drinking water, and satellites to carry out Coast Guard missions. These innovations have led to multiple patents awarded to the Department of Mechanical Engineering. These patents include a pandemic ventilator, a soft robotic system to apply pressure to a wound, and a unique system to detect when a buoy needs to be serviced. The major is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Department of Naval Architecture and Marine Engineering

Department Head: CDR Michael Daeffler, PE

The Department of Naval Architecture and Marine Engineering provides an undergraduate academic major based on engineering, mathematics, science, humanities, and professional maritime studies. Graduates from the program successfully serve as Coast Guard Officers across a wide spectrum of Coast Guard missions, including primarily Naval Engineering and Marine Safety Engineering positions, but also aviation, deck, and management. Post Coast Guard, our graduates succeed throughout the business world in fields ranging from developing cutting-edge engineering projects to running major companies. While perhaps appearing to be a specialized field, NA&ME is actually a very broad field as it requires the knowledge to synthesize highly complex systems that incorporate almost all fields of engineering and project management, and our graduates are some of the most highly sought in the Coast Guard and business worlds.

The NA&ME program provides an all-encompassing educational basis for professional engineering practice in the Coast Guard and commercial marine industry segments. As the majority of our cadets go on to attend graduate school, the program provides considerable latitude for postgraduate study in naval architecture, marine engineering, mechanical engineering, material science, and other technical and non-technical fields. The program emphasizes developing the student's ability to understand and apply engineering principles to the design and analysis of U.S. Coast Guard, Navy, commercial, and recreational vessels, as well as many other engineered systems. Practical hands-on engineering projects blended with computer-aided design and analysis methods provide students a coordinated mix of theoretical and practical engineering, with an emphasis on ships and small craft design. Facilities include a large Hydromechanics Lab which features a very rare, large towing tank; a well-equipped design lab with multiple 3D printers; and a Power Lab which houses a ShopBot numerically-controlled router used to create hull forms and other models with extensive tooling for foam, composites, wood and metal fabrication. The major is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

The department's engineering faculty bring a broad national and international experience to the classroom. Our four Rotating Military Faculty officers highlight recent fleet and graduate school experience while the four award-winning civilian faculty hold doctorates from top-ranked schools around the world and bring the knowledge of long-term engineering practice to the students. Our two PCTS officers combine the best of both, and our highly accomplished engineering technician brings extensive practical engineering knowledge to our lab classes. With an average of 25 students per year in the major, and an average class section size of just 16, the NA&ME program is known for its close-knit community that strongly supports its students, staff, and faculty.

School of Science, Mathematics, and the Humanities

Dean: PROF Richard Zuczek, PhD
Associate Dean: CAPT Victoria Futch, PhD

The School of Science, Mathematics, and the Humanities contains the bulk of the Core Curriculum at the U.S. Coast Guard Academy, providing the essential science, mathematics, and liberal arts foundations requisite for all major areas of study. The School houses six departments staffed by an experienced faculty of civilian professors, permanent commissioned teaching staff, rotating military instructors, and Joint Duty appointments from the Department of State and Customs and Border Protection. This community of educators is dedicated to fostering learning environments that fully embrace the power of multiple perspectives and contributions.

The School delivers a core curriculum for all Academy students throughout their four years of matriculation. The cornerstones of higher education, these comprehensive courses reside in all six departments and enrich the writing, analytical, critical thinking, and public speaking skills of all students, ensuring they are prepared to lead in the U.S. Coast Guard. Additionally, the School offers three majors across the six departments: Marine and Environmental Sciences, Operations Research and Data Analytics, and Government. These majors deliver cutting-edge programs that embrace the latest pedagogical, technological, and methodological features of Higher Education, while also maintaining direct relevance to Coast Guard missions. Consequently, senior year for most cadets culminates in a capstone research project sponsored by, or completed for, Coast Guard stakeholders. As with the other schools, all majors in SSMH are completed in four years and prepare graduates to serve in any career path in the Coast Guard. Graduates command cutters and shore stations, inspect commercial vessels, lead policy offices and regulatory projects, prosecute environmental crimes, guide intelligence operations, manage asset acquisitions, fly aircraft, and pursue a vast range of graduate school opportunities. The School of Science, Mathematics, and the Humanities prepares cadets for a successful career in the Coast Guard, and beyond.
Consists of the following departments:

- Department of Chemical and Environmental Sciences
- Department of Culture and Languages
- Department of Government
- Department of Marine Sciences
- Department of Mathematics
- Department of Physics

Department of Chemical and Environmental Sciences

Department Head: PROF Joshua Gray, PhD

The Department of Chemical and Environmental Sciences is responsible for providing core curricular support for general chemistry and a vast array of upper-level chemical and environmental courses. Faculty and cadets are involved in a wide range of research projects that deal with interesting and important Coast Guard-relevant environmental issues. These include measurement and detection of disease, pollution, and illicit drugs, oil spill weathering, and environmental policy in support of the Coast Guard's 11 statutory missions. The Chemical and Environmental Sciences Department coordinates the Environmental Science concentration in the Marine and Environmental Sciences program. The Environmental Sciences concentration provides a multi-disciplinary and technical education in environmental science 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, Environmental Law and Policy, 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 environmental resource management. Students choose a specialty track to focus on an aspect of particular interest in their course work. There are five predesignated tracks in the areas of Mass and Energy, Environmental Policy, Environmental Health, Geospatial Intelligence, and Water and Soil. Resources used by students in the Environmental Science concentration include chemistry and biology labs equipped with state of the art analytical and chemical instrumentation, remote sensing facilities including a satellite ground station, computer laboratories, and the research vessel Greeley. In addition to coursework, the department supports capstone projects, independent research, and summer internships that 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. Use is made of the nearby Thames River estuary for field studies and experiments.

Department of Culture and Languages

Department Head: PROF Alex Waid, PhD

The Department of Culture and Languages provides the essential humanities component to the academic experience at the U.S. Coast Guard Academy. The core curricular courses delivered by the department, College Composition and the four Cultural Perspectives courses, develop cadets' writing, critical thinking, and public speaking skills while imbuing them with an appreciation for perspectives involved in understanding the human condition. The department offers courses in a variety of disciplines, including Philosophy, History, Literature, Spanish, English, Writing, Morals & Ethics, and more. The Department of Culture and Languages is woven into the Government Major, offering an array of its requirements and electives, including Literature, Creative Writing and Public Speaking. The courses that the department offers help cadets better understand others through their cultures, histories, and languages. They help our future officers understand how to make moral, ethical, and intellectual decisions in an informed and meaningful manner. Culture and Languages courses develop lifelong learners and teach cadets how to deal with subjective and complex information, looking at multiple sides of questions critically and with empathy while cultivating the habits of mind that lead to successful members of our Coast Guard, Military, and Nation. Cadets studying Culture and Languages courses ultimately deepen their expertise in creative and critical thought, problem solving, effective written and oral communications, global civilizations, and relationship building.

Department of Government

Department Head: PROF Evan Haglund, PhD.

As one of the largest departments on campus, the Government Department is a quintessential part of the U.S. Coast Guard Academy. As a military service academy, the government major is at the center of debates focused on citizenship, civilian-military relations, international relations, public policy, law enforcement, security policy, political participation, and how global challenges impact political life. Coursework includes both quantitative and qualitative research methodologies, so that majors are prepared for real world applications and future graduate study. Cadets will have opportunities to do internships in Connecticut, at Headquarters in Washington, DC, across multiple federal agencies, and internationally. Classes are taught by civilian professors and military officers. There is a dedicated group of military attorneys who teach criminal justice courses in the department and a rotating group of instructors from various federal positions such as the State Department and Customs and Border Protection. Government majors have priority access to prestigious leaders who are regularly hosted by the Department including U.S. Presidents, Justices of the Supreme Court, US Cabinet officials, foreign dignitaries, and leaders of multinational Non-Governmental Organizations.

Department of Marine Science

Department Head: PROF Deanna Bergondo, PhD

The Department of Marine Science, located in Smith Hall, is an interdisciplinary collective of civilian and military faculty who have a shared interest in the marine environment and is one of three departments responsible for executing the Marine and Environmental Sciences major. Faculty expertise includes a wide variety of specialties such as fisheries management, marine ecology, geospatial sciences, oceanography, and meteorology. Marine Science faculty also teach the Atmospheric and Marine Science core curricular course, a senior level course designed to prepare graduates to apply weather and ocean science concepts in operational settings.

Within the Marine and Environmental Sciences major, Marine Science faculty oversee the Marine Science concentration and the Geospatial Intelligence Certificate Program. The Marine Science concentration is a blend of physical oceanography, biological-environmental sciences, and geospatial sciences. Cadets in this concentration can study and conduct research on relevant topics such as illegal, unreported, and unregulated fishing, ocean acidification, microplastics, and oil spill response. Resources available to students in the Marine Science concentration include the Science Innovation Laboratory housed at the Maritime Center of Excellence (MCOE), computer laboratories, and the research vessel Greeley. The Geospatial Intelligence Certificate Program is housed in the Department of Marine Science but is open to all cadets. This program teaches students to leverage geospatial intelligence in maritime operations and aims to prepare students for more advanced study and post-military careers in geospatial intelligence.

Department of Mathematics
Department Head: PROF Jillian McLeod, PhD

The Department of Mathematics, staffed by civilian and military faculty, aims to increase student's understanding of mathematical concepts, develop their analytical problem-solving skills, and illustrate the practical application of mathematics to everyday problems. The department's focus is to support the Academy's Shared Learning Outcomes, the Operations Research and Data Analytics (ORDA) major, and the broad technical core curriculum, including courses in calculus, linear algebra, discrete mathematics, and probability/statistics for students of all majors. In addition, the mathematics faculty administer the ORDA curriculum, comprised of courses concentrating on the fundamentals of mathematical reasoning and analysis as well as the theory and tools of operations research, statistics, and data analytics, machine learning, and artificial intelligence. In addition to broad mathematical understanding, our graduates have a strong background in object-oriented computer programming, as well as experience utilizing computer algebra systems, optimization software, and simulation packages.

Department of Physics
Department Head: PROF Brooke S. Stutzman, PhD

The Department of Physics, located in Smith Hall, is responsible for providing core curricular support for introductory calculus-based physics courses as well and an assortment of upper-division courses focused on the application of physics principles to the environment. As part of the Marine and Environmental Sciences Major, the Department of Physics hosts the Environmental Monitoring concentration of the Marine and Environmental Sciences Major. In this concentration, cadets learn the science governing the state of the environment, options for energy sources, and the use of remote sensing, via satellites and drones, to measure the state of Earth. Cadets in this concentration can sub-specialize in GEOINT, Physical Oceanography, Systems, or Aerospace tracks. Capstone research projects include energy production, plasma purification of drinking water, drones and sensor development, CubeSats and satellite communications, high-temperature and high-pressure physics related to planetary formation, and the measurement and modeling of atmospheric chemistry. Some of these projects include partnerships with the Environmental Protection Agency, NASA, and/or other colleges and universities. The Department of Physics hosts the easternmost Mobile CubeSat Command and Control (MC3) ground station in the US. From this ground station, the Coast Guard Academy and other government partners are able support small satellite operations. The 2024-2025 academic year marks 22 years since Physics has moved from traditional teaching practices to separate lecture and lab session in favor of an integrated and active learning environment. Cadets experience the evidence-based practices of think-pair-share, group work, test-enhanced learning, and just-in-time teaching.

School of Leadership and Management
Dean: CAPT Corinna Fleischmann, PhD, PE, CSBA
Associate Dean: Vacant

The School of Leadership and Management prepares future commissioned officers of the U.S. Coast Guard to be competent and ethical management professionals. Through the Management program, the School offers a broad-based, high-quality business education that leads to a Bachelor of Science degree in Management. Additionally, the Nautical Science department prepares all Coast Guard Academy cadets with the knowledge, skills, and abilities to navigate, operate, and manage Coast Guard cutters and other operational assets in the maritime environment. Collectively, the faculty and staff are committed to a holistic mentoring program and use a community-based approach to foster engaged learning. This approach challenges cadets through a rigorous course of study and creates opportunities to apply knowledge in experiential settings.
Consists of the following departments:

- Department of Management
- Department of Nautical Science

Department of Management
Department Head: PROF Matthew Keblis, PhD

The Department of Management functions much like a typical business school at civilian institutions of higher education and is internationally recognized for providing high-quality business education grounded in engagement. It is one of the smallest

business programs in the world that is accredited by AACSB International, the premier accrediting body for collegiate business programs. The broad program of study is guided by the emerging needs of the Coast Guard through its Management Advisory Council, comprised of the Coast Guard's Chief Financial Officer, Chief Information Officer, Chief Human Capital Officer, and other senior managers from Coast Guard Headquarters, and higher education leaders. The Management Department further enables Coast Guard management effectiveness through faculty scholarship and consulting.

The Management major has one of the larger enrollments at the Academy. Cadets enrolled in the Management major study a wide range of business disciplines including accounting, finance, economics, management, behavioral/organizational science, leadership, marketing, management of information systems, quantitative methods, and analytics. In addition to learning business competencies, graduates must demonstrate proficiency in leadership, communication skills (verbal and written), and critical thinking. The Management plan of study aims to deliver small class sizes in its advanced courses, to ensure lively discussion and a tailored learning process that is interactive and highly collaborative. All classes in the Management program of study are taught by qualified faculty members under rigorous AACSB standards. The faculty also serve as high-touch career advisers to their cadets whom they get to know both in and out of the classroom.

After graduation Management alumni can serve as line officers in any operational mission specialty – aboard ships, in planes, and at shore units. After establishing an operational specialty, Management alumni find themselves particularly well-suited to be stewards and managers of the U.S. Coast Guard's financial, human, and information resources. The Coast Guard is a global organization with an approximate $12 billion per year budget, a total workforce of over 85,000 people, and extensive interdependent information systems that are changing at the pace of technology. Many Management alumni are selected by the Coast Guard to attend graduate school full-time and are fully funded. They have attended some of the most prestigious MBA, accounting, and information systems management programs in the country. Management alumni have an outstanding record of academic achievement at graduate school, and an exemplary record of performance as senior resource managers.

Department of Nautical Science

Department Head: CDR Piero Pecora

The Department of Nautical Science is located in Yeaton Hall. A four-year Navigation and Nautical Science curriculum is delivered by the Department culminating with the issuance of a 100-Ton Merchant Mariner Master's License after graduation for those cadets that meet all Coast Guard requirements. The curriculum equips prospective Ensigns with foundational knowledge necessary for Commissioning, to include foundational navigation theory, relative motion and collision avoidance, Bridge Resource Management, and other compounding shipboard and leadership skills developed over the four-year program. In addition to providing theory and application in the classroom, the material for these courses is reinforced with experiential learning in shipboard simulators and on the waterfront. Additionally, the Department of Nautical Science serves as the program manager for the Ship Control and Navigation Training System (SCANTS), which includes two full mission bridge simulators and a multitude of advanced part-task simulators that supports shipboard preparation of prospective commanding and executive officers afloat. Accordingly, the Department of Nautical Science concurrently serves as the CGA liaison to the Office of Cutter Forces (CG-751), Coast Guard Personnel Command (OPM-2), and the Coast Guard National Maritime Center.

Cadet Division

Commandant of Cadets: CAPT Edward Hernaez
Assistant Commandant of Cadets: CDR Mike Mastriani

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 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 of Cadets directly oversees a full-time staff of approximately 100 people. The Commandant of Cadets is located in Chase Hall: the four annexes, 450 room building that serves as the home for the Corps of Cadets.

The Cadet Division is organized into three branches:

- **The Cadet Branch** is responsible for the execution of the Leadership Development Program and the associated Chase Hall Leadership Development Practicum. This is accomplished through the direct oversight and mentorship of the Company Officers and Company Chiefs, professional military members who instruct the Corps of Cadets about the targeted leadership competencies for each class.
- **The Cadet Training and Operations Branch** is responsible for the entire spectrum of training delivered to the Corps of Cadets across the 200-week course of instruction, including summer training assignments, internships, and the cadre summer experience. The Cadet Training and Operations Branch is comprised of Cadet Training, Career Development, Cadet Administration, and Weapons Training. It also serves as liaison to the fleet and to Coast Guard Cutter EAGLE, the Academy's 295-foot 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.

Athletics Division

Athletic Director: Dr. Daniel Rose
Associate Athletic Director: Ms. Donna Koczajowski

Many factors contribute to the development of leaders of character. In addition to the Coast Guard Academy's emphasis on the intellectual and professional development of cadets, there is a high value placed upon each cadet's physical development and wellness. This is accomplished through classes in the Health and Physical Education Department, athletics competition during the daily 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 twelve men's sports, ten women's sports, 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. Oversight of the Athletic Division is provided by the Director of Athletics.

Academic Policies and General Regulations

Degree and Graduation Requirements

Requirements for the degree of Bachelor of Science are as follows:

a. Pass or validate every course in the Core Curriculum.
b. A cadet must complete at least 130 semester hours at USCGA (including those completed in the SAEP and the Connecticut College Exchange Programs, not to exceed 24 semester hours) to satisfy residency requirements, regardless of semester hours validated. Courses which do not fulfill residency requirements include HPE courses, validated courses, courses carrying no semester hour credit, satisfactory/unsatisfactory graded courses, and failed courses.
c. Attain a cumulative grade point average of at least 2.00.
d. Attain an upper-division grade point average of 2.0. This is the grade point average across all required upper-division courses in the major, as specified in the official Academic Catalog/Catalog of Courses as applicable. For repeated courses, the highest grade will be included in the average.
e. Satisfy the academic requirements for one of the majors as specified in the official Academic Catalog/Catalog of Courses.
f. Be in residence at the Academy for at least four academic years (a semester spent in the SAEP program counts as a semester in residence).

Additional graduation requirements in addition to the degree requirements listed above are published in the Regulations for the Corps of Cadets:

g. Successfully complete 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.

Unless specifically waived by the Superintendent, conferral of the degree of Bachelor of Science requires completion of all Graduation Requirements.

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.

Bachelor of Science

Each major has standards specific course requirements and validating courses taken externally. In addition, there are distribution requirements that apply to all majors and overall requirements for graduating with a Bachelor of Science degree.

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
- 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

- Cyber Systems
- Electrical Engineering
- Government
- Management
- Marine and Environmental Sciences
- Mechanical Engineering
- Naval Architecture and Marine Engineering
- Operations Research and Data Analytics

Each major has specific course requirements, including the distribution courses, mandatory courses, area or related elective courses, designated course substitutions, and optional free elective courses. Given the breadth of study inherent in the Academy's core curriculum, free electives are not required for graduation. Therefore, they can be waived if at least 15 academic credits (not including Health and Physical Education credits) are taken each semester.

Double Major

Students with a strong academic record, a cumulative GPA of 3.00 or higher, may elect to take a second major with the approval of both Program Chairs and the cognizant Dean(s).

All courses classified as major requirements, to include major area electives and technical electives, for both majors need to be fulfilled. Depending upon the two majors selected and the number of validations granted, students should expect to overload in multiple semesters and complete 20 to 30 academic credits above the first major. The USCGA cannot guarantee the completion of the second major as scheduling and resource constraints may prohibit course offerings.

Credit Hour Definition and Scheduling

The Registrar prepares the academic calendar no less than 12 months in advance of the planned academic year ensuring the credit hour definition is met. The following is also adhered to:

1. The Academic Calendar must have a minimum of 750 minutes of instruction per credit hour. The standard meeting times for courses are a 50-minute, Monday-Wednesday-Friday schedule and a 75-minute, Tuesday-Thursday schedule.
2. The calendar is planned with a minimum of 42 Monday-Wednesday-Friday meeting days and 28 Tuesday-Thursday meeting days.
3. For the standard 3-credit hour course, 2,100 minutes of instruction, prior to the final examination period, are required.
4. The final examination period may be counted in the minutes of instruction.

Cadet/Student Rank

In following military tradition, students at the Coast Guard Academy are labeled cadets. Within the Corps of Cadets there is a classification structure of rank which correlates with the traditional higher education level of study. This is outlined below.

4/c cadet	Freshman or First Year
3/c cadet	Sophomore
2/c cadet	Junior
1/c cadet	Senior

Course Numbers

Each course has a 4-digit identifier. The first digit represents the subject area. The second digit usually represents the academic level of the course, namely 4/c, 3/c, 2/c, or 1/c. The third and fourth digits are for sequencing. The Academy's course numbering system is as follows:

0100 – 0999	Miscellaneous Offerings
1000 – 1999	Engineering

2000 – 2999	Government/Law/English and Foreign Language
3000 – 3999	Mathematics
4000 – 4999	Health and Physical Education
5000 – 5999	Chemistry/Marine Science/Physics
6000 – 6999	Nautical Science
7000 – 7999	Cyber Systems
8000 – 8999	Management

Future editions of the Academic Catalog will include a revised course numbering system. All course numbers will include a two- to four-letter department or program identifier along with a three-number course designator. Future course numbers are listed in the course listing at the end of this version of the Catalog with a "Future Course #" designator. Future course numbers listed elsewhere in the Catalog are included in parentheses. Please note: Future course numbers are not listed in the major Plans of Study in this version of the Catalog.

Future Department or Program Identifiers:

CES	Chemical and Environmental Sciences
CEE	Civil and Environmental Engineering
CL	Cultures and Languages
EEC	Electrical Engineering and Computing
CYS	Cyber Systems
GOV	Government
HPE	Health and Physical Education
MGT	Management
MS	Marine Science
MAT	Mathematics
ME	Mechanical Engineering
NAME	Naval Architecture and Marine Engineering
NS	Nautical Science
PHY	Physics

Future course designators. The first number of the course designator describes the level of the course as

100-level	Introductory courses, primarily intended for 4/c cadets.
200-level	Courses primarily intended for 3/c cadets.
300-level	Advanced undergraduate courses primarily intended for 2/c cadets.
400-level	Advanced undergraduate courses primarily intended for 1/c cadets.

The future course numbing system and all future course numbers are subject to change.

Registration for Courses

Course offerings and specific instructions are distributed in advance by the Registrar's Office. During the spring semester, cadets select the courses they wish to complete during the next academic year. Cadets, working with their academic advisor, may modify their schedule during the Add/Drop period.

The Registrar will administer registration of 4/c cadets for fall and spring semester courses. Individual course assignments are made based on the following: intended major, placement testing completed during the summer, and departmental course validations approved by the corresponding Program Chair.

Directed Studies Courses: Cadets desiring to pursue study in 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 applicable Program Chair. The Registrar must be informed in writing of all authorized substitutions.

Minimum Course Load: All cadets are required to register for a minimum of fifteen credits (not including any HPE requirements) during each fall and spring semester. Cadets who are offered extended opportunity may register for a reduced

course load (less than fifteen semester hours) as directed by the School Dean of their academic major. Cadets should use the Permission to Register for Exceptions form to record the approval to underload. Cadets scheduled for summer semesters must enroll in two courses.

Academic Overloads: Those 3/c, 2/c, or 1/c cadets in good academic standing may petition the School Dean of their academic major to overload, to carry more than nineteen credits (not including HPE or Peer Tutoring credits). Cadets on Academic Probation or Extended Opportunity wishing to overload or cadets requiring an overload to meet graduation requirements must also obtain approval. Cadets should use the Permission to Register for Exceptions form to record the approval to overload. All overload requests must be submitted prior to the beginning of the semester for which the overload will take place.

Add/Drop Period: During the first week of classes each semester, cadets may add courses to their schedule or drop courses from their schedule at the Registrar's Office after consulting with their Academic Advisor. Dropped courses do not appear on the academic transcript. Exceptions to this policy include dropping an additional course if the cadet is accepted into a course at Connecticut College (normally after the first week of classes at USCGA), and certain instances where, due to injury or unforeseen circumstance, the cadet is unable to complete an enrolled course. Cadets must maintain the minimum academic load as defined in this catalog unless a request for an academic underload is approved by the School Dean of their academic major. Cadets should use the Permission to Register for Exceptions form to capture the approval.

Course Withdrawal: Cadets requesting to withdraw from a course must work closely with their Academic Advisor to ensure they remain on track to meet the graduation requirements without an overload in future semesters. Cadets cannot withdraw from a course if they fall below the Minimum Course Load of fifteen credits (not including any HPE requirements) for the semester. The Course Withdrawal Request must be made to and approved by the respective Program Chair, through the Academic Advisor, prior to 1600 hours on Study and Conference Day. In certain circumstances, a cadet may request to withdraw from a course and drop below the required Minimum Course Load. Such a request must be made to the Vice Provost for Academic Affairs through their Academic Advisor and Program Chair and normally would include input from the cadet's GOLD Team. If the Course Withdrawal Request is approved, the cadet will receive a "W" on their academic transcript for the withdrawn course. Cadets must complete the published course requirements for all remaining courses, including scheduled final exams.

In the case of a cadet injury, HPE courses will be dropped from the semester registration as opposed to being withdrawn. Cadets will be scheduled for the HPE course in the following semester.

In the case of a resignation that occurs prior to 1600 hours on Study and Conference Day, the cadet will receive a "W" for all courses not completed prior to the resignation.

If a cadet is disenrolled from the Academy or otherwise resigns, the cadet may request to have grades assigned for the semester in which their disenrollment or resignation occurred. In this situation, grades will be assigned as follows:

a. Only course material submitted up to and including the date of disenrollment or resignation will be included.
b. Letter grades should be assigned based on the total course content completed up to the date listed in a. above relative to the entire course content. For example, if the cadet had completed 525 points of 600 points up to the date listed above and the total course content is out of 1000 points, the cadet will be assigned the letter grade that corresponds to 52.5% (525/1000).
c. All policies listed in the course syllabus must be followed. For example, if the course syllabus requires a final exam or a final project which was not completed by the cadet, a grade of "F" should be assigned.

Following the assignment of grades by course instructors, the requesting cadet will be advised of the entire slate of grades to be assigned for the semester and will then be given the opportunity to accept those grades or have all grades remain as "W". This process must occur for the entire slate of grades, i.e., either all course grades will be accepted, or all grades will revert to "W". The cadet's decision to accept course grades or have grades remain as "W" is final and may not be appealed.

Prerequisite Policy

Before registering for a course, cadets should verify that they satisfy all course prerequisites. Cadets who do not satisfy the prerequisites for a course will generally not be allowed to register for the course. Waivers of prerequisites may be granted by the appropriate academic department for substantive reasons. Cadets and academic advisors should check prerequisites before every semester registration.

Course Substitutions

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

Validations/Transfer Credit

Because the Academy experience includes a 200-week leadership and professional development program, all new cadets undertake Swab Summer together, starting as freshmen. Although students who transfer credit will not enter the Academy with advanced academic standing, credit earned elsewhere will be evaluated by the academic departments and accepted to satisfy core requirements through a validation procedure.

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 may not be taken at a subsequent time for academic credit. A validated course does count for purposes of meeting the ABET minimums for the combined math and sciences, engineering topics, and general education component -- the intent is that a validated course results in the addition of a free elective to that cadet's individual curriculum.

Cadets appointed to the Service Academy Exchange Program must be prepared to submit course descriptions and/or syllabi to the applicable CGA Program Chair or his/her designated course reviewer. Courses approved to be taken as part of the SAEP will substitute for a CGA course requirement and are included in the cumulative GPA. An official transcript from the other service academy must be provided upon completion of the semester for grades to be entered on the USCGA academic record.

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 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
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, Program Chairs 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:

School of Engineering and Cyber Systems Validations

Cadets may validate courses offered by the School of Engineering and Cyber Systems if they have accomplished requirements (b) or (c) above and gained the written approvals of the Program Chair in charge of that course and the Dean of the School. Cadets may be required to take an oral or written exam to demonstrate adequate proficiency in the course material.

School of Science, Mathematics, and the Humanities Validations

Department of Culture and Languages and Department of Government

Cadets may validate 2163 American Government if they have taken an accredited college course with a transcript grade

of B or better, or if they have earned a score of 5 on an Advanced Placement Examination in American Government. Documentation must be provided to the 2163 course coordinator and Government Program Chair before the start of the cadet's 4/c fall semester. Cadets can also validate 2163 by passing an examination administered by the CGA course coordinator or the Program Chair during Swab Summer.

No Major Requirement Courses in the Government major may be validated unless *all* the following requirements are met.

- Completion of a course with a grade of "B" or higher from an in-person, accredited four-year institution of higher education, and
- Validation by the USCGA course coordinator and Government Program Chair that the course meets USCGA Government major learning objectives and grade requirements equivalency.
- Please note 2111 may not be validated.

Department of Mathematics

Validation policy for 3111 Calculus I, 3117 Calculus II, 3211 Multivariable Calculus, 3215 Differential Equations:

a. Validations for 3111 Calculus I and 3117 Calculus 2 will only be offered to students during the Math Placement program, which occurs during Swab Summer. Cadets who place into 3111 Calculus I will automatically be offered an opportunity to take validation exam for 3111 Calculus I. If the student's performance on the validation exam is deemed to display sufficient mastery by the placement coordinator or one of the Mathematics Program Chairs, the student will be offered the opportunity to either:
   (1) validate 3111 Calculus I and enroll in 3115 Calculus II (V) in the fall of their freshman year,
   (2) validate Calculus I and attempt a validation exam for 3115 Calculus II (V),
   (3) decline validation of Calculus I and enroll in 3111 Calculus I in the fall freshman year.

b. If a cadet has declared Management or Government as their major and is offered validation of 3111 Calculus I, the cadet is eligible to take a validation exam for 3213 Probability and Statistics at the beginning of the fall semester of their freshman year. If the cadet's performance on the placement exam is deemed to display sufficient mastery of 3213 Probability and Statistics topics by the Mathematics Program Chair, the cadet will be offered the opportunity to either,
   (i) validate the course, or
   (ii) decline validation and enroll in 3213 Probability and Statistics during their freshman year.

c. If a cadet has declared any major except for Management or Government and their performance on 3115 Calculus II (V) exam is deemed to display sufficient mastery of 3115 Calculus II (V) topics, the cadet will be offered the following opportunities, either:
   (i) take a validation exam for 3211 Multivariable Calculus,
   (ii) take a validation exam for 3215 Differential Equations,
   (iii) take a validation exam for 3211 Multivariable Calculus and 3215 Differential Equations.

These validation exams will only be offered at the beginning of the fall semester of the cadet's freshman year.

3. Validation of any other 3XXX courses:

a. Validation of 3XXX courses not specifically addressed in the Academic Catalog shall not normally be granted. Cadets who believe they have the requisite skills/knowledge to validate such courses may petition the Program Chair responsible for the course to administer a validation examination. 3471 Operations Analysis cannot be validated by any cadet.

Departments of Chemical and Environmental Sciences, Marine Science, and Physics

The validation criteria for Chemistry I and II is an AP test score of 4 or 5, or satisfactory passage of the Department of Chemical and Environmental Sciences' validation exam. Completion of an equivalent course at another accredited college as determined by the Department Head may also merit validation.

The validation criterion used for Physics I or II is demonstrated proficiency on a Physics I or II validation exam administered by the Department of Physics. Successful completion of an equivalent calculus-based course at another accredited college as determined by the Department Head may also merit validation.

Validation of other science courses will be made on a case-by-case basis for courses completed at another accredited college. Normally, the validation authority for science courses not part of the Core Curriculum will be the Marine and Environmental Sciences Program Chair.

School of Leadership and Management Validations

Cadets may validate courses offered by the Department of Management 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.

Health and Physical Education Department Validations

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 their capacity to meet the skill and the academic criteria of a specific course. Cadets may validate select HPE courses within the first week of the semester. All validations are to be conducted by the course instructors under the direction of the HPE Department Head, and any changes shall be processed through the Registrar's Office in accordance with course Add/Drop procedures.

Classes and Grading

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 Information System (RegIS). 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 faculty member assigned to each course/section is responsible for evaluation of student course work and ultimately for accurate grade assignment and timely submission.

Standard grading system

The following grades may be assigned as appropriate:

Grade	Quality Points	Description
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
W	0.00	Withdrawal from Course

Non-standard grades

Z	0.00	Audit of Course
V	0.00	Validation Credit
S	0.00	Satisfactory
U	0.00	Unsatisfactory

Temporary grades

I	0.00	Incomplete

Incomplete Grade Policy: Inability to complete the required coursework or take an examination due to extenuating circumstances may, at the discretion of the instructor, result in a grade of Incomplete. Extenuating circumstances include:

(1) incapacitating illness or injury which prevents a cadet from attending classes;

(2) a death in the immediate family;
(3) other emergencies deemed appropriate by the instructor.

A grade of Incomplete should not be requested, nor given, for lack of completion of work because of poor time management or dissatisfaction with the grade earned. Incomplete is not given as a substitute for a failing grade, nor will it be given as means of raising a grade by completing additional work after the final grade submission deadline for the semester the course was taken.

Cadets should speak to instructors to determine a plan identifying what work still remains to be completed, when that work will be completed, and what grade will be assigned if the work is not submitted. The cadet initiates the request for an Incomplete grade at least one week before the end of the term. The cadet and instructor shall complete the Request for Grade of Incomplete form and route the approved form to the Registrar's Office for processing.
Once the work is completed, instructors must complete a Grade Change Request form and route it to the Registrar's Office via the Program Chair. If no grade change is submitted within 180 days of the grade of incomplete being assigned, a grade of "F" will be posted to the academic record unless a default grade is specified by the instructor on the Request for Grade of Incomplete form. Degrees will not be conferred with Incomplete grades on the official transcript.

Deadline for course material submission: Except in cases where an incomplete grade is assigned, a student must submit all material for course credit before the close of the grading period for the semester. Once the instructor has submitted a final grade for a course, the instructor may not accept additional work.

Appeal of Assigned Course Grades: A cadet who believes their assigned courses grade is incorrect has five working days from the date grade submission is closed to request a review by the instructor. Valid reasons for a grade change include clerical errors, computational errors, and/or overlooked components of submitted work. Submission of additional course materials after the end of the grading period is not a valid reason to request a grade review. If the instructor does not respond within five working days, the student should contact the department head for the department in which the course is offered.

If the instructor agrees to a grade change, they shall follow the procedures posted by the Registrar to initiate the change. If the instructor determines the original grade is correct, the cadet may appeal this decision, in writing, to the instructor's Department Head. The Department Head will then make a decision within ten days after conferring with both the cadet and the instructor. If the grade request is not resolved to the cadet's satisfaction, the cadet may request a review by the Dean of the cognizant School who will make the final determination in conjunction with the instructor and Department Head.

Grade Point Averages: All courses taken at any time for academic credit, with the exception of courses graded as Satisfactory/Unsatisfactory, are counted toward the term (TGPA) and cumulative grade point averages (CGPA). These include courses taken at the Coast Guard Academy and through the Service Academy and Connecticut College Exchange Programs. Grade points for each course are determined by multiplying the quality points associated with the grade received with the course credits. For example, a three-credit course for which a cadet received a B- will have 8.1 grade points (3 x 2.7). Grade point averages are determined by adding the grade points for a given period and dividing them by the total course credits of that period.

TGPA = Total grade points for a term divided by the total credits for the term
CGPA = Total of all eligible grade points divided by total eligible credits.

Courses validated are listed as such on the transcript, but they are not included in computations of grade point averages.

Repeating Courses: Except for selected topics, research, projects, directed studies and certain designated academic and HPE courses, courses may not be repeated except under two circumstances: a course was failed or the earned grade does not meet the minimum major grade requirement. Cadets may not repeat courses to improve the previously earned grade unless repeating the course is approved by the Vice Provost for Academic Affairs. For the major GPA calculation, only the highest grade earned for a repeated course will be used. All grades earned are included in the calculation for the term (TGPA) and cumulative grade point averages (CGPA).

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 required minimal progress 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, the academic record of every cadet is reviewed by his or her academic advisor at the end of each semester to assess performance and identify potential problems. At the end of each semester, the Director of Academic Advising applies certain criteria to cadet academic records and refers cadets who are having difficulty to the Academic Review Board (ARB). Academic Deans and Program Chairs also review the files and make further recommendations when deemed appropriate. The Vice Provost for Academic Affairs chairs the ARB which includes the academic Deans, representatives from the Registrar's Office, Admissions, Athletics, and the Commandant of Cadets. If the ARB believes that a cadet is in a position from which recovery is not possible, they will be referred to the Provost and the Superintendent with a recommendation for disenrollment or extension. If a cadet is disenrolled and wishes to appeal the Superintendent's decision, the cadet must prepare and submit, via the chain of command, a formal request in accordance with the Regulations for the Corps of Cadets.

Performance Guidelines

Good Standing: A cadet whose academic performance indicates that they will fulfill all the graduation requirements on schedule is said to be in "Good Standing." This is ascertained at the end of each semester through the aforementioned Academic Performance Review process that involves the Provost, Academic Review Board, or GOLD Advisory team (the Guide for Officer Leadership Development-GOLD Team, consists of the cadet's Academic Advisor, Company Officer/Chief, Coach or physical education representative, and official mentors for the cadet). A cadet found to not be in Good Standing is subject to probation (see below) or restrictions of eligibility for all extracurricular activities (e.g., sports, clubs, vocal and musical activities, band, etc.). These restrictions are subject to the approval of the Provost in coordination with the Director of Athletics (any sport activity restrictions), or the Commandant of Cadets (any vocal, music, band or club restrictions).

Academic Intervention: A cadet who is placed in Academic Intervention status will undergo heightened monitoring to ensure progress in the Academic Program. Assignment to Academic Intervention status is not designed to be punitive, but rather recognizes that an individual's intellectual, emotional, and physical condition is affected by many factors, and may at times require coordinated support to ensure success in Academics. Normal requirements following assignment to Academic Intervention include a GOLD Team meeting and the completion of the Academic Intervention GOLD Team report, although additional requirements may be imposed by the Provost, Vice Provost for Academic Affairs, Academic Program Chairs and/or GOLD Team. Cadets are automatically removed from Academic Intervention Status at the end of the semester. Cadets are normally placed on Academic Intervention status if they meet any of the following criteria:

a. Midterm Grade Point Average (MTGPA) of 1.5 or lower.
b. A significant event(s) which leads to a reduction in course load for the semester.
c. Cadets may also be placed on Academic Intervention status for other reasons by the Provost or the Vice Provost for Academic Affairs in consultation with a cadet's Academic Advisor, GOLD team, cognizant and/or (intended) major Program Chair.

Academic Probation: A cadet who is placed on Academic Probation is subject to restrictions imposed by the Provost, the Commandant of Cadets and the Director of Athletics. These will include, but are not necessarily limited to, a schedule of mandatory consultations with the academic advisor and completion of the Academic Intervention Action Plan at the beginning of each semester. 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 TGPA of 2.50 or greater for one semester or a 2.00 or greater for two successive semesters (not including the Summer Term) may petition the Vice Provost for Academic Affairs to be removed from academic probationary status provided they no longer meet the academic criteria for academic probation as outlined above. Additional details on procedures for petitioning for removal from Academic Probation are found in the Regulations for the Corps of Cadets.
Cadets are normally placed on academic probation at the end of a semester if they meet any of the following criteria:

a. Term Grade Point Average (TGPA) of less than 2.00.
b. Cumulative Grade Point Average (CGPA) of less than 2.00.

c. Grade Point average in required upper division courses in the major of less than 2.00.
d. Two Fs in one semester or a total of 3 Fs accumulated overall.

Cadets may also be placed on academic probation by the Provost or the Vice Provost for Academic Affairs in consultation with the Academic Review Board, Deans, Program Chairs, and Academic Advisors for other reasons.

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. Such cadets may be registered for reduced course loads as directed by the Provost. Cadets on Extended Opportunity are automatically placed on Academic Probation and are reviewed by the Academic Review Board each semester that they remain at the Academy. Extended Opportunity cadets who attain all requirements for removal from Academic Probation following the semester in which the extension is granted may apply from removal from probation following the standard procedure.

Disenrollment: A cadet who is disenrolled from the Academy is separated permanently unless they subsequently apply and are 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 and "upper division" grade point average. For the purpose of determining eligibility for Academic Probation or disenrollment, however, any Fs received prior to the readmission are excluded. If a cadet is disenrolled and wishes to appeal the Superintendent's decision, the cadet must prepare and submit, via the chain of command, a formal request in accordance with the Regulations for the Corps of Cadets.

- Any 4/c cadet who receives three Fs in the fall semester may be referred to the Superintendent with a recommendation for disenrollment.
- Any cadet who accumulates a total of four or more Fs may be referred to the Superintendent with a recommendation for disenrollment.

Academic, Physical, and Military Recognition

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

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

- **Superintendent's List:** recognizes cadets named to both the Provost's List and the Commandant of Cadets List.

- **Provost's List:** identifies cadets who achieve a 4.00 TGPA while taking at least a normal course load of fifteen credit hours (not including HPE credits) and have no course grade less than a C in any course weighted more than one credit and no failing grade in any course.

- **Dean's List**: identifies cadets who achieve a term GPA of at least 3.60 and less than 4.0 while taking course load of fifteen or more credit hours (not including HPE credits) and have no course grade less than a C in any course weighted more than one credit and no failing grade in any course.

- **Commandant of Cadet's List:** Cadets who earn a minimum Military Precedence Index as prescribed by the Commandant of Cadets may qualify. 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.

- **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).

- **PFE Honors:** recognizes those cadets who achieve a 285 or above on the semester physical fitness examination (PFE). Cadets will be permitted to wear the fitness achievement bronze star on his/her uniform during the semester of his/her examination. A long weekend will be granted for the semester of achieved PFE Honors status.

- **300 Club:** recognizes cadets who achieve a perfect score of 300 on the PFE. Cadets will be admitted to the 300 Club in addition to receiving PFE Honors. Cadets in the 300 Club will receive a PFE 300 Club T-shirt provided by the Department of HPE. The 300 Club T-shirt will be authorized to wear during study hours.

- **1/c PFE Incentive Award:** recognizes 1/c cadets who achieve a perfect score of 300 on the PFE on the Fall Semester Official PFE. These cadets will be exempt from taking the Spring Semester Official PFE. The score of 300 will be carried over from the fall semester to the spring semester.

- **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 Provost'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:
    - **Summa Cum Laude** for those cadets with a cumulative GPA of 3.85 and above
    - **Magna Cum Laude** for those cadets with a cumulative GPA of at least 3.65 and below 3.85
    - **Cum Laude** for those cadets with a cumulative GPA of at least 3.5 and below 3.65
    - The **Honor Graduate** designation recognizes the cadet who graduates with the highest Cumulative Grade Point Average.

Summer Academic Term

The Academy offers up to two summer academic terms, with each term encompassing five to six weeks. Enrollment is generally based on the following criteria:

- Cadets placed in the Foundation for Calculus and Introduction to College Communications courses as result of initial course placement.
- Cadets who have completed 3111 (MAT 111) Calculus I, but not 3115 (MAT 115)/3117 (MAT 117), Calculus II, by the end of 4/c year and are in a major that requires Calculus II at the start of 3/c fall to meet prerequisite requirements in that major's nominal plan of study.
- Cadets within a major that requires Calculus II at the start of 3/c fall to meet prerequisite requirements in that major's nominal plan of study who fail 3117, Calculus II, in their 4/c year.
- Cadets with a major that require 1118 (CEE 118) Engineering Mechanics at the start of 3/c fall to meet prerequisite requirements in that major's nominal plan of study who have not yet passed 1118 Engineering Mechanics with the required grade to continue into major-required follow-on courses, in their 4/c.
- Cadets otherwise approved for summer term by the Vice Provost for Academic Affairs.

Cadets will be registered for two academic courses during the summer term. Summer term courses vary; however, historically, 1118 (EEC 118) Engineering Mechanics, 3117 (MAT 117) Calculus II, 8115 (MGT 115) Macroeconomic Principles, and 8211 (MGT 211) Organizational Behavior and Leadership are offered during the summer term. Additional offerings are determined based on cadet need and faculty availability.

Academic Enrichment

Internships

Most academic departments offer internship opportunities. These are competitive, maybe for credit or not-for-credit, and occur both during the academic semester and during the summer. Internships place cadets at Coast Guard units, Coast Guard headquarters, industrial-commercial partners, other federal agencies, and overseas programs.

Individual departments and programs define and determine their internships, which are then coordinated through the Director

of Enrichment, often in concert with Cadet Training. Cadets will work with their advisors and the cognizant Program Chairs and department personnel to identify and pursue internships.

Prestigious Scholarships Program

This program cultivates academic excellence across all majors and encourages scholarly achievement. This program prepares cadets to compete for postgraduate fellowships and scholarships such as the Rhodes, Marshall, Fulbright, Truman, Schwarzman, and Gates.

Exchange Programs

Service Academy Exchange Program (SAEP)

The Coast Guard Academy has a semester-long exchange program with the U.S. Air Force Academy at Colorado Springs, the U.S. Military Academy at West Point, and the U.S. Naval Academy at Annapolis. Cadets selected for this program attend the participating academy during the fall of their 2/c year. Academic grades received at other service academies transfer to USCGA and are included in the cumulative GPA. Cadets on exchange with other service academies may use a course taken during their exchange semester to meet a CGA course requirement provided it is of similar content/credit they have not previously taken the course at USCGA, and it is approved by the applicable CGA Program Chair or Dean. Cadets may take HPE courses while on exchange however HPE courses taken at the U.S. Naval Academy carry no credit so cannot be used to satisfy any HPE requirement at USCGA. Cadets may not take 4303, Personal Defense II: Maritime Law Enforcement Techniques, while on exchange. Cadets participating in the SAEP should discuss their HPE schedule with their advisor and the Registrar prior to departure.

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 Vice Provost for Academic Affairs. Enrollment in this program is normally limited to 1/c cadets who have demonstrated strong academic achievement. This is a single course exchange program. Enrollment is limited to a single course per student per semester.

Accreditation

Institutional Accreditation

The U.S. Coast Guard Academy is accredited by the New England Commission of Higher Education (NECHE). Inquiries regarding the status of the U.S. Coast Guard Academy's accreditation by the New England Commission of Higher Education should be directed to Academy administrative staff. Individuals may also contact the Commission: New England Commission of Higher Education, 3 Burlington Woods Drive, Suite 100, Bedford, MA 01803-4514.

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

Professional Accreditation

The Naval Architecture and Marine Engineering, Civil Engineering, Electrical Engineering, and Mechanical Engineering programs are accredited by the Engineering Accreditation Commission of ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 – telephone: (410) 347-7700. The Cyber Systems Program is accredited by ABET, Inc. Computing Accreditation Commission. The Marine and Environmental Sciences Program is accredited by ABET, Inc. Applied and Natural Science Accreditation Commission.

Cadet Life and Resources

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.
Cadet Life - United States Coast Guard Academy (uscga.edu)

Academic Support Services

Academic Advising Program prepares cadets to make sound decisions and to set their own priorities. 4/c cadets must initially meet with their academic advisors every two weeks. As cadets progress through their four years at the USCGA, however, 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. Even though a faculty member may be assigned to a cadet as an advisor, cadets are free to consult with any faculty member. The faculty and staff are deeply concerned for the welfare and success of each cadet, and they will generously give their time to any cadet.

Cadet Academic Advisory Board (CAAB) provides a direct channel of communication between the Corps of Cadets and the Provost. 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 Provost's Council.

Cadet Academic Assistance Program (CAAP) provides discipline-specific, voluntary evening workshops and tutoring to help cadets with course concepts, classroom assignments and test preparation.

4/c Cadet Academic Support Program (4CASP) provides mandatory instruction in selected subject areas to designated 4/c cadets who have been deemed to potentially benefit from directed, hands-on, supplemental academic work.

Early Warning System provides information to faculty and academic advisors concerning the academic performance of 4/c cadets so that intervention strategies can be promptly implemented to help cadets succeed at the Academy.

Fundamentals of Mathematics and Communication Program (FMCP) supports 4/c cadets whose SWAB Summer placement scores indicate they would benefit from assistance in the fundamentals of mathematics, English, and reading. Support includes placement in foundational courses in the fall semester and two classes during the summer before their 3/c year.

Hewitt Writing and Reading Center (HWRC) is located on the second deck of the Library in Waesche Hall. Mentors and tutors in the HWRC provide assistance to cadets in all class years and majors. The HWRC is open Sunday through Thursday evenings and during most business hours. Cadets can make an appointment and upload work through an online scheduling program. Faculty and civilians who are professional writers and educators staff the HWRC. Established in 1987, the HWRC operates, in part, from funds provided by the John and Erna Hewitt Endowment.

International Cadet Council (ICC) engages in activities 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, and the U.S. Naval War College. Cadets also participate in the annual United States Naval Academy (USNA) International Ball. Through identification of host families and assessment of cadets' interests and language skills, the coordinator of the ICC facilitates the assimilation of international cadets into the Corps of Cadets and introduces them to many aspects related to day-to-day living in the U.S.

Peer Tutor Program is comprised of 3/c through 1/c cadets who have performed well academically and have successfully completed training and certification. A list of peer tutors and the courses they support is posted on the Corps of Cadets Regimental Staff home page and on the peer tutor site located under Academic Resources on the Academic Division section of the portal.

The Cadet Command Religious Program

The Superintendent is responsible for the physical, moral, and spiritual well-being of all cadets, faculty, and staff. The Superintendent provides spiritual welfare through the Command Religious Program (CRP), managed by assigned Navy chaplains assigned to CGA.

Chaplains provide a robust ministry to cadets, faculty, staff, and family members. They facilitate the religious needs of all and provide liaison to civilian religious leaders, communities, organizations, and agencies. CGA chaplains care for all regardless of faith background or no faith background and offer complete confidentiality in counseling. Chaplains also advise leadership on issues of ethical and spiritual wellness and morale. Our chaplains provide weekend and weekday religious services during SWAB Summer and during the Academic Year, as well as religious education and sacramental preparation when the Corps of Cadets is aboard.

Center for Counseling & Development (CCD)

The CCD focuses on the developmental transitions and clinical mental health of Coast Guard Academy (CGA) cadets. The CCD strives to enhance resilience and leadership capabilities, support CG initiatives for the overall mental health needs of the CGA.

Licensed psychologists, who have particular expertise in the college-aged population, staff the Center. They are available to meet with Academy cadets who are experiencing personal or mental health concerns. Psychotherapy and supportive counseling sessions may address a variety of topics including stress management, interpersonal relationships, depression, anxiety, family matters, eating or body image concerns, sexual assault or other trauma, loneliness, self-esteem, motivation, academic difficulty, and life transitions.

Counseling and psychotherapy are confidential and do not become part of a cadet's medical, academic, or military record. The CCD also serves as a confidential resource for cadets who experience sexual assault, whether or not they report it. Our office number is (860) 444-8520, and email is CGACounselingCenter@uscga.edu.

Coast Guard Academy Regional Clinic

The CG Academy Regional Clinic is the 2nd largest clinic in the Coast Guard. The Clinic includes an Outpatient Department, Dental Clinic, Pharmacy, Radiology, Physical Therapy, moderate complexity Lab, Physical Exam Department, Optometry and Psychiatry. The Clinic provides routine care for illness and injury to Academy cadets and active duty, as well as several local CG units in the region. A Duty Crew is available 24 hours a day, to include a medical officer and dental officer on call. The professional staff consists of U.S. Public Health Service officers detailed to the Coast Guard, Coast Guard active duty personnel, and civilian contractors. The staff includes physicians with board certifications in family medicine, flight medicine, preventive medicine and psychiatry. Also, on staff are board-certified physician assistants, pharmacist, doctoral level physical therapist, optometrist, and registered nurses. The dental clinic staff consists of three dental officers, two dental hygienists, and dental technicians. The Clinic has the capability to perform routine laboratory tests and x-rays within our facility. Prescribed medication is provided at an onsite pharmacy.

For specialty care, cadets are referred to civilian providers, and the Coast Guard pays for all necessary medical and dental care for you through the military health insurance system known as TRICARE. All specialties are represented nearby at Lawrence & Memorial Hospital in New London and Backus Hospital in Norwich. For certain subspecialty treatment other facilities can be utilized, to include University of Connecticut Health, Yale-New Haven Hospital, and Walter Reed National Military Medical Center.

Library

The Library located in Waesche Hall, provides the resources, spaces, and services for academic success and to encourage lifelong learning. Library staff are available until 2200 five days a week to help with research, finding resources, and much more. Librarians collaborate with faculty to integrate information literacy skills into the curriculum. Access is provided to over 900,000 books and e-books and 200,000 full text journals and 69,000 streaming videos. Online resources, including subscriptions to over 250 academic databases, are available anywhere on-campus and off-campus. Items from other libraries can be requested through the interlibrary loan service. Materials related to the history of the Coast Guard are collected and preserved to support the Academy's educational programs and to provide cadets with a connection to the traditions of their service. A wide variety of spaces are available in the Library for individual and group learning, including large tables, collaboration workstations, study rooms, small group tables, and individual carrels for quiet study.

Registrar's Office

The Registrar's Office 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's Office 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's Office include publishing the Academic Catalog (formerly known as the Catalog of Courses) and maintaining 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 Provost and the Vice Provost for Academic Affairs.

Admissions Division

The mission of the Admissions Division is to attract and appoint a uniquely prepared selection of prospective cadets who are suited to develop into future leaders of character and commissioned officers of the United States Coast Guard. The division is responsible for Recruitment: outreach, orientation, applicant pool generation and Selection: applicant pool evaluation and appointment decisions.

All policies, procedures and requirements for admissions to USCGA may be found in the Admissions section of the USCGA website: https://uscga.edu/admissions/

Curriculum

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

Cadet academic work is guided by a 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. Courses are designed in compliance with current Executive Orders and all applicable policy.

Philosophy of Education

With a foundation in the liberal arts (science, mathematics, and the humanities), the Coast Guard Academy provides a challenging outcomes-oriented curriculum focused on active student learning. Our goal is to facilitate the development of highly successful Coast Guard officers and to engender an appreciation and habit for lifelong 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 for the educational program is steeped in leadership and a strong commitment to continuous quality improvement. No single teaching method or forum is given precedence over the other. The educational experience at the Coast Guard Academy focuses on critical inquiry. This means that academic work is collaborative, experiential, interactive, and exciting.

Core Curriculum

#	Title	Credits
Computing and Cyber Technology (4.5 credit minimum)		
1104 (EEC 104)	Introduction to Computing, or 3142 (MAT 142) Data Exploration and Visualization or 3225 (MAT 225) Computer Modeling Languages or 7104 (CYS 104) Principles of Programing or 8142 (MGT 142) Tools for Business Intelligence	3.00 3.00 3.00 3.00 3.00
7310 (CYS 310)	Introduction to Cyber Technology or 1226 (EEC 126) Computer Communications and Networking	1.50 3.50
Communication (3 credit minimum)		
2111 (CL 111)	College Composition	3.00
Cultural Perspectives and Global Challenges (9 credit minimum)		
213X (CL 13X)	Cultural Perspectives Offering (1 course)	3.00
2163 (GOV 163)	American Government	3.00
2485 (GOV 485)	Global Challenges	3.00
Ethics and Law (7 credit minimum)		
2293 (CL 293)	Moral, Ethical, and Political Philosophy or 2394 (CL 394) Introduction to Moral & Ethical Phil and 1493 (CEE 493) Engineering Ethics, or 5493 (MS 493) Science Ethics Seminar, or 7294 (CYS 294) Cyber Policy, Compliance, and Ethics	3.00 2.00 1.00
2398 (GOV 398)	Principles of Criminal Justice and Maritime Operational Law	4.00
Mathematics (7 credit minimum)		
3111 (MAT 111)	Calculus I	4.00
3213 (MAT 213)	Probability and Statistics or 3341 (MAT 341) Probability Theory	3.00 3.00
Science (13.5 credit minimum)		
5102 (CES 102)	Chemistry I	4.00
5162 (PHY 162)	Physics I	4.00
5216 (MS 216)	Oceanography or 5206 (CES 206) Chemistry II or 5266 (PHY 266) Physics II	4.00 4.00 4.00
5444 (MS 444)	Atmospheric and Marine Sciences	1.50
Nautical Science (16 credit minimum)		
6101 (NS 101)	Fundamentals of Navigation	4.00
6201 (NS 201)	Ships and Maritime Systems	3.00
6202 (NS 202)	Applications in Navigation	1.00
6301 (NS 301)	The Maritime Watch Officer	4.00
6401 (NS 401)	Professional Maritime Officer	3.00
6402 (NS 402)	Professional Maritime Officer Lab	1.00
Management and Leadership (6 credit minimum)		
8115 (MGT 115)	Macroeconomic Principles or 8313 (MGT 313) Essentials of Economics for Engineering Majors	3.00 2.00
8211 (MGT 211)	Organizational Behavior and Leadership	3.00

Health and Physical Education Program

Many factors contribute to the development of leaders of character. In addition to the Coast Guard Academy's emphasis on the intellectual and professional development of cadets, there is a high value placed upon each cadet's physical development and wellness. This is accomplished through classes in the Health and Physical Education Department, athletics competition during the daily 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 twelve men's sports, ten women's sports, and three coeducational varsity sports. The intercompany and club sports program is very active, and cadet driven. Oversight of the Athletic Division is provided by the Director of Athletics.

The Mission states: "To graduate young individuals with sound bodies, stout hearts, and alert minds..." 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 aquatic 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. To assess their physical development competencies, cadets must successfully complete all Physical Fitness Examination (PFE) requirements each semester while at the Academy. Cadets are required to be active in co-curricular physical activities such as intercollegiate athletics or intercompany or club sports each semester where they develop psychosocial and sport skills through their participation. The Health and Physical Education (HPE) curriculum includes 4 credits of required (core) courses called the Guardian Ethos. The Guardian Ethos curriculum is designed to develop professional competencies and skills in areas of swimming, Health and wellness, Physical movement and development, and law enforcement.

Cadets will also be required to take 2 credit hours of HPE electives and may choose from a variety of lifetime physical activities. These electives may be taken at any time during their 3/c-1/c years. 4/c year will be reserved for the Core HPE courses only, with the exception of any 4/c cadet who validates Swimming 1 may choose to add a HPE elective if their schedule allows. Cadets must satisfactorily complete or validate all Guardian Ethos HPE courses during the designated assigned class year. As a graduation requirement, each cadet must pass or validate a minimum of six (6) academic credits in HPE.

#	Title	Credit
Guardian Ethos Core Courses (4.0 credits)		
4111 (HPE 111)	Swimming	0.50
4115 (HPE 115)	Physical Movement and Development	1.00
4222 (HPE 222)	Professional Rescuer	2.00
4303 (HPE 303)	Personal Defense II: Maritime Law Enforcement Techniques	0.50
HPE Electives (2.0 credit)		
4204 (HPE 204)	Lifetime Sports I: Badminton	0.50
4215 (HPE 215)	Lifetime Sports II: Pickleball	0.50
4304 (HPE 304)	Lifetime Sports III: Tennis	0.50
4405 (HPE 405)	Adventure Sports I: Rock Climbing	0.50
4407 (HPE 407)	Dance	0.50

4411 (HPE 411)	Scuba Diving	0.50
4415 (HPE 415)	Adventure Sports II	0.50
4439 (HPE 439)	Theory of Coaching	1.00
4459 (HPE 459)	Sport/Wellness Leader	0.50
4464 (HPE 464)	Strength and Conditioning	0.50
4470 (HPE 470)	Yoga	0.50
4471 (HPE 471)	Bowling	0.50
4489 (HPE 489)	Selected Topics in Health and Physical Education	0.50 - 2.00

Degree Programs

The following sections for each major include a statement about the major, the course requirements, and a recommended eight-semester Program of Study (POS).

Civil Engineering

Program Chair: CAPT Brian Maggi, PhD, PE

The Civil and Environmental Engineering (CEE) section provides a solid background in mathematics and basic sciences applied toward the study and design of engineered systems. The program emphasizes development of open-ended problem solving, team building skills, creativity, and communication ability with particular emphasis on balancing theory and practice of engineering so that graduates are intellectually and professionally prepared to provide engineering services to the Coast Guard. Civil Engineering is a broad field encompassing many disciplines. Upper Division courses in the major, 1300 level or higher, include study in structural engineering, geotechnical engineering, environmental engineering, construction management, transportation, coastal resiliency, and water resources. In the senior level capstone design course, students integrate what they have learned in the design of a Civil and/or Environmental Engineering system. Most capstone projects involve work on Coast Guard related projects.

If a student has validated a course, no grade for that course is included in the average. If a course is repeated, only the highest final grade earned in that course will be included in the Upper-Division GPA calculation; however, all grades appear on the transcript. A passing grade must be earned for all major courses unless validated. The program remains a Civil Engineering program and is ABET accredited, http://www.abet.org.

The Civil Engineering Major produces graduates who achieve the following Student Outcomes:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

In addition, the Civil Engineering Major produces graduates who:

Within 7 years after graduation, graduates of the Civil Engineering Program:

- Perform effectively in a variety of career paths as Junior Officers in the Coast Guard.
- Provide appropriate Engineering expertise to the Coast Guard while serving in Civil Engineering related billets.
- Demonstrate a commitment to intellectual and professional growth through activities and accomplishments such as graduate study, professional licensure, professional society activity, and/or continuing education.

Core Curriculum Requirements Substitutions for Civil and Environmental Engineering Major:

Core Requirement	CEE Course Substitution
3213 (MAT 213) Probability and Statistics	3341 (MAT 341) Probability Theory
3216 (MAT 216) Ordinary Differential Equations and Linear Algebra with Applications	

CE Major Course Requirements

Lower Division Required Courses (28.5 or 29 Credits)

A grade of C or above is required for 1118 and 1206.

1118 (CEE 118)	Engineering Mech - Statics	3
1206 (CEE 206)	Mech of Materials	3.5
1210 (CEE 210)	Mat'ls Civil/Constr Engr	4
3117 (MAT 117)	Calculus II	4
3211 (MAT 211)	Multivariable Calculus	3
Or		
3216 (MAT 216)	Ordinary Diff Eqtns & Linear Algebra w/ Applications	3.5
5206 (CES 206)	Chemistry II	4
5266 (PHY 266)	Physics II	4

Upper Division Required Courses (38 Credits)

Upper Division courses listed below are required. Additional Upper Division courses are listed within the CEE Elective.

1304 (CEE 304)	Soil Mechanics	4
1309 (CEE 309)	Environmental Engr I	4
1312 (CEE 312)	Transportation Engineering	3
1313 (CEE 313)	Steel Design	3
1317 (CEE 317)	Struct Analysis	3
1321 (EEC 321)	Elec Cir & Machines	4
1340 (NAME 340)	Fluid Mechanics	3
1401 (CEE 401)	Construction Project Mgmt	4
1404 (CEE 404)	Geotechnical Engr Design	3
1407 (CEE 407)	Environmental Engr II	3
1411 (CEE 411)	Reinf Concrete Design	3
1491 (CEE 491)	FE Review	1
1493 (CEE 493)	Engineering Ethics	1

Civil and Environmental Engineering Elective (Minimum 3 Credits)

Engineering elective courses for the CE major are defined as engineering courses, 1200 level or higher, of 3 credits or greater. In special cases (and with prior approval by the CE Program Chair), Directed Studies in Civil and Environmental Engineering (1419) may be considered a major area elective.

1211 (NAM 211)	Dynamics	3
1351 (ME 351)	Thermodynamics	3
1406 (CEE 406)	Coastal Resiliency	3
1409 (CEE 409)	Water Resources Engr	3
1414 (CEE 414)	Struct Dsgn Extreme Events	3

Capstone (4 Credits)

1402 (CEE 402)	Civil Engineering Design	4

Cadets in 4/c and 3/c years will be closely monitored by the Program Chair if they do not maintain a minimum 2.00 GPA in Engineering (1000 series), Science (5000 series), and Mathematics (3000 series) courses and earn a grade of C or better in the following courses: 1118 (CEE 118) Engineering Mechanics - Statics and 1206 (CEE 206) Mechanics of Materials. The Program Chair will craft a plan for the cadet's academic success as needed. This may involve a recommended Change of Major to ensure the cadet is tracking to meet graduation requirements.

Civil Engineering Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
		4/c Year			
1101	Intro to Experiential Engr I	1.00#	1118	Engineering Mech – Stat	3.00*
2111	College Composition	3.00*	2163	American Government	3.00*
3111	Calculus I	4.00	3117	Calculus II	4.00
3142	Data Explor and Vis	3.00	4115	Personl Movemnt & Dev	1.00
4111	Swimming	0.50	5162	Physics I	4.00
5102	Chemistry I	4.00	6101	Fndamntls of Navigation	4.00
	Academic Total	**15**		**Academic Total**	**18**
	Semester Total	**15.50**		**Semester Total**	**19.00**
		3/c Year			
1206	Mech of Materials	3.50	1210	Mat'ls Civil/Constr Engr	4.00
3211	Multivariable Calculus	3.00	2394	Intro Moral & Ethical Phil	2.00
3213	Probability & Statistics	3.00	3216	Ord Diff Equat & Lin Algebra	3.50
4222	Professional Rescuer	2.00	5206	Chemistry II	4.00
5266	Physics II	4.00	6201	Ships & Maritime Sys	3.00
6202	Apps in Navigation	1.00	8313	Essentials of Economics	2.00
8211	Org Behavior/Ldrship	3.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**17.5**		**Academic Total**	**18**
	Semester Total	**19.5**		**Semester Total**	**19/19.5**
		2/c Year			
1304	Soil Mechanics	4.00	1312	Transportation Engr	3.00
1309	Environmental Engr I	4.00	1313	Steel Design	3.00
1317	Struct Analysis	3.00	1407	Environmental Engr II	3.00
213X	Cultural Perspectives	3.00	4303	Personal Defense: MLE Tech	0.50
5444	Atmospheric & Mar Sci	1.50	6301	Maritime Watch Officer	4.00
7310	Intro to Cyber Tech	1.50	1XXX	Engineering Elective	3.00-4.00
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**17**		**Academic Total**	**16/17**
	Semester Total	**17.5/18**		**Semester Total**	**16.5/17.5**
		1/c Year			
1321	Elec Cir & Machines	4.00	1402	Civil Engr Design	4.00
1401	Const Proj Mgmt	4.00	1493	Engineering Ethics	1.00
1404	Geotechnical Engr Design	3.00	2398	Prin CJ & Maritime Op	4.00
1411	Reinf Concrete Dsgn	3.00	2485	Global Challenges	3.00
6402	Professional Maritime Officer Lab	1.00	6401	Professional Maritime Off	3.00
1491	FE Review	1.00	XXXX	HPE Elective	0.50-1.00
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**16**		**Academic Total**	**15**
	Semester Total	**16.5/17**		**Semester Total**	**15.5/16**

* These courses may be scheduled during the Fall or Spring Semester.
+ Cultural Perspectives may be scheduled outside of 4/c year.
# 1101 Intro to Experiential Engineering I is optional but encouraged.

Cyber Systems

Program Chair: LCDR Jennifer Rogers, PhD

The Cyber Systems (CYS) major prepares future officers for exciting careers in cybersecurity within the Coast Guard with a focus on developing, integrating, and implementing cutting-edge computing technologies in an interconnected cyber world. The Cyber Systems major comprises a strong academic foundation in secure technical computing balanced with a managerial cyber emphasis. This major's curriculum encompasses the interdisciplinary knowledge required by the National Security Agency/Department of Homeland Security National Center of Academic Excellence in Cyber Defense Education (NSA/DHS NCAE-CDE) program. The major provides students with the necessary foundations for the design and development of assured, secure computer systems to defend computer networks, enable Coast Guard missions, and protect critical national infrastructure. The program challenges cadets to become critical thinkers who can design and implement computer systems and software to solve real-world technical problems. This major includes managing information technology, understanding a systems approach, and achieving fluency with information systems. Research and capstone areas include such dynamic and diverse fields as security, physical systems, risk management, intelligence, policy, geospatial science, secure software development, and network security all within a cyber context. If a student has validated a course, no grade for that course is included in the average. If a course is repeated, only the highest final grade earned in that course will be included in the Upper-Division GPA calculation; however, all grades appear on the transcript. A passing grade must be earned for all major courses unless validated. The Cyber Systems program is accredited by the ABET Computing Accreditation Commission. It has also been validated by the National Centers of Academic Excellence in Cybersecurity in the field of Cyber Defense.

The Cyber Systems Major produce graduates who achieve the following Student Outcomes:

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in cyber related activities.
6. Apply security principles and practices to maintain operations in the presence of risks and threats.

Cyber Systems Program Educational Objectives

The U.S. Coast Guard Academy Cyber Systems program produces graduates who, within several years of graduation:

- Demonstrate proficiency in the professional practice of computing and cybersecurity as Coast Guard junior officers.
- Demonstrate intellectual or professional growth as evidenced by post-graduate education, licensing, certification, promotion, and participation in pertinent professional societies.
- Contribute cyber expertise to U.S. Coast Guard technical challenges, especially in the Command, Control, Communications, Computers, Cyber, and Intelligence (C5I) community.

CYS Major Course Requirements

The following are course requirements for the program. In parenthesis are the credit minimum credit or number of course requirements. A typical degree program of study is also provided.

Core Curriculum Requirements Substitutions for Cyber Systems Major:

Core Requirement	CYS Course Substitution
7310 (CYS 310) Intro to Cyber Technology	Not Required
3rd Lab Science	5266 (PHY 266) Physics II
3213 (MAT 213) Probability and Statistics	3341 (MAT 341) Probability Theory and 3343 (MAT 343) Mathematical Statistics
8115 (MGT 115) Macroeconomics Principles	8313 (MGT 313) Essentials of Economics
2293 (CL 293) Moral, Ethical and Political Philosophy	2394 (CL 394) Intro to Moral and Ethical Philosophy and 7294 (CYS 294) Cyber Policy, Compliance, and Ethics

Lower Division Required Courses (7 credits)

1118 (CEE 118)	Engineering Mech – Statics	3
3117 (MAT 117)	Calculus II	4

Upper Division Required Courses (44.5 Credits)

For the purposes of USCGA graduation requirements, upper-division courses in the Cyber Systems major are defined as those major required courses specified below and two courses that serve as the Major Area Electives. If a course is repeated, only the highest final grade earned in that course will be included in the Upper Division GPA calculation. Additionally, students must receive a C or above for 1220 (EEC 220), 1226 (EEC 226), 7218 (CYS 218), and 7294 (CYS 294).

1220 (EEC 220)	Trans to Obj Ori Prog	2
1225 (EEC 225)	Digital Circ/Comp Sys	4
1226 (EEC 226)	Comptr Comms & Ntwks	3.5
1328 (EEC 328)	Software Engineering	4
2282 (GOV 282)	Intel & Cyber Ops	3
3237 (MAT 237)	Discrete Mathematics	3
7218 (CYS 218)	Fundamentals of Info Security	3
7238 (CYS 238)	Intro to Cryptography	3
7294 (CYS 294)	Cyber Policy, Compl, and Ethics	2
7330 (CYS 330)	Comp & Net Security	4
7345 (CYS 345)	Operating Systems	3
7381 (CYS 381)	Database Systems	3
7385 (CYS 385)	Cyber Risk Management	3
8419 (MGT 419)	Info Tech in Orgs	3
8453 (MGT 453)	Systems Analysis & Design	3

Major Area Electives (Minimum 2 Courses)

Cyber Systems is an interdisciplinary program. Major Area Electives for the CYS major provide an opportunity for students to further explore related academic disciplines and/or customize their major based upon their interests. These courses will provide additional context and/or depth to the plan of study. Special attention must be paid to meeting all pre-requisites when selecting electives. Other courses may be considered with prior approval of the CYS Program Chair.

- Cadets with a strong interest in intelligence should consider taking 2281 (GOV 281) 2/c fall, 2375 (GOV 375) 1/c fall, and then 2282 (GOV 282) 1/c spring. Course 2282 (GOV 282) requires U.S. citizenship and a Secret Security Clearance.
- 3341 (MAT 341) and 3343 (MAT 343) replace 3213 (MAT 231) Probability and Statistics, and 3211 (MAT 211) would need to be taken in advance.
- For cadets interested in earning the GEOINT Certificate, information is in the Marine and Environmental Science Degree Program section of the catalog.
- Students may also take Computer Science or Foreign Language Courses at Connecticut College as Major Area Electives subject to prior CYS Program Chair approval.

1212 (EEC 212)	Analytical Methods in Engineering	4
1218 (EEC 218)	Electrical Engineering I	4
	or 1321 (EEC221) Electric Circuits & Machines	4
1312 (CEE 312)	Transportation Engineering	3
1340 (NAM 340)	Fluid Mechanics	3
1431 (EEC 431)	Electronic Navigation	3
1461 (ME 461)	Mechatronics	3
2235 (CL 235)	Spanish I	4
2236 (CL 236)	Spanish I/II	4
2237 (CL 237)	Spanish II	4
2269 (GOV 269)	National Security Policy	3
2281 (GOV 281)	Intel and Democracy	3
	Or 2282 (GOV 282) Intel and Cyber Ops	3
2335 (CL 335)	Spanish III	3
2337 (CL 337)	Spanish IV	3
2355 (GOV 355)	Public Policymaking	3

2361 (GOV 361)	Intro to Political Theory	3
2362 (GOV 362)	Homeland Security Policy	3
2367 (GOV 367)	International Relations	3
2375 (GOV 375)	Strategic Intelligence: Collection and Analysis	3
2397 (GOV 397)	Const Law and Hmlnd Sec	3
2265 (GOV 265)	Comparative Politics	3
3211 (MAT 211)	Multivariable Calculus	3
3215 (MAT 215)	Diff Equations	3
3221 (MAT 221)	Linear Algebra	3
3231 (MAT 231)	Linear Optimization	3
3235 (MAT 235)	Comp Model Languages	3
3238 (MAT 238)	Algorithms with Applications	3
3341 (MAT 341)	Probability Theory	3
3343 (MAT 343)	Mathematical Statistics	3
5206 (CES 206)	Chemistry II	4
5312 (CES 312)	Analytical Methods in Chem	4
5330 (MS 330)	Geospatial Science I	3.5
	or 5475 (MS 475) Intro to Geospatial Science	3
5367 (PHY 367)	Remote Sensing	3
5417 (CES 417)	Toxicology	3
5430 (MS 430)	Geospatial Science II	4
5435 (MS 435)	Emergency Management	3
8217 (MGT 217)	Microeconomic Principles	3
8241 (MGT 241)	Legal Env of Bus	3
8348 (MGT 348)	Managerial Accounting	3
8246 (MGT 246)	Financial Accounting	3
8349 (MGT 349)	Financial Management	3*
8461 (MGT 461)	Supply Chain Management	3*

* Pre-requisites are waived for these Management Department courses for Cyber Systems majors

Capstone Experience (Minimum 6 Credits)

7426 (CYS 426)	Capstone Experience I	4
7436 (CYS 436)	Capstone Experience II	4

All Cyber Systems majors are required to successfully complete a research-based capstone experience their 1/c year. Capstone experience options require a focused research project that culminates in a written report/paper and oral presentation. The capstone requirement must be fulfilled through (1) a year-long Capstone Project.

The Capstone Projects in 7426 (CYS 426) Cyber Systems I and 7436 (CYS 436) Cyber Systems II are the default Capstone Experience for Cyber Systems cadets. Cadets who take these courses will do so along with their Electrical Engineering classmates and will follow the same process as is completed in 1426 (EEC 426) and 1436 (EEC 436) either in support of cyber aspects of Electrical Engineering projects or in completion of entirely distinct Cyber Systems projects. These courses normally meet twice a week as a class and provide 10 hours per week for project work.

Students must meet the graduation requirements set forth in this catalog. Cyber Systems major cadets must also achieve a C or higher in: 1220 (EEC 220) Transition to Object Oriented Programming, 1226 (EEC 226) Computer Communications and Networks, 7218 (CYS 218) Fundamentals of Information Security, and 7294 (CYS 294) Cyber Policy, Compliance, and Ethics.

Cyber Systems Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
7104	Principles of Programming	3.00*	1118	Engineering Mech – Stat	3.00*
2111	College Composition	3.00*	2163	American Government	3.00*
3111	Calculus I	4.00	3117	Calculus II	4.00
4111	Swimming	0.50	4115	Personl Movemnt & Dev	1.00
5102	Chemistry I	4.00	5162	Physics I	4.00
			6101	Fndamntls of Navigation	4.00*
	Academic Total	**14**		**Academic Total**	**18**
	Semester Total	**14.50**		**Semester Total**	**19**
3/c Year					
1220	Trans to Obj Ori Prog	2.00	1225	Digital Circ/Comp Sys	4.00
2394	Intro Moral & Ethical Phil	2.00	1226	Comptr Comms & Ntwks	3.50
5266	Physics II	4.00	3237	Discrete Mathematics	3.00
6201	Ships & Maritime Sys	3.00	4222	Professional Rescuer	2.00
7218	Fund of Information Security	3.00	6202	Apps in Navigation	1.00
8211	Org Behavior/Ldrship	3.00	7294	Cyber Policy, Compl, & Ethics	1.00
XXXX	HPE Elective	0.50-1.00	8115	Macroeconomic Prin	3.00
	Academic Total	**17**		**Academic Total**	**15.5**
	Semester Total	**17.5/18**		**Semester Total**	**17.5**
2/c Year					
3213	Probability & Statistics	3.00*	1328	Software Engineering	4.00
7238	Intro to Cryptography	3.00	4303	Personal Defense: MLE Tech	0.50
7345	Operating Systems	3.00	5444	Atmospheric & Mar Sci	1.50*†
7381	Database Systems	3.00	6301	Maritime Watch Officer	4.00*
8453	Systems Analysis & Design	3.00	7385	Cyber Risk Management	3.00
213X	Cultural Perspectives	3.00[+]	8419	Info Tech in Orgs	3.00†
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**15**		**Academic Total**	**15.5**
	Semester Total	**15.5/16**		**Semester Total**	**16**
1/c Year					
7426	Capstone Experience I	4.00	7436	Capstone Experience II	4.00
2398	Prin CJ & Maritime Op Law	4.00*	2282	Intel & Cyber Ops	3.00†
6402	Prof Maritime Officer Lab	1.00*	2485	Global Challenges	3.00*
7330	Comp & Net Security	4.00	6401	Professional Maritime Officer	3.00*
XXXX	Major Area Elective	3.00-4.00	XXXX	Major Area Elective	3.00-4.00
XXXX	HPE Elective	0.50-1.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**16/17**		**Academic Total**	**16/17**
	Semester Total	**16.5/18**		**Semester Total**	**16.5/18**

* These courses may be scheduled during the Fall or Spring Semester.
† These courses may be scheduled during 2/c or 1/c year to accommodate Major Area Electives.
[+] Cultural Perspectives may be scheduled outside of 4/c year.

Electrical Engineering

Program Chair: PROF Kelly Seals, PhD

The Electrical Engineering (EE) major prepares future officers to be the leaders in designing, developing, implementing, and evaluating new technologies in the Coast Guard. The student who completes this program will be thoroughly ready for professional practice as an electrical engineer and a wide spectrum of postgraduate studies. Major prescribed courses provide an integrated understanding of the core disciplines of electrical engineering. These include circuit design, digital communications, signal processing, control systems, computer programming, and computer networking. In addition to this comprehensive foundation, students select Major Area Electives from a list of courses that provide additional breadth to their study as well as Engineering Electives from an even broader list of courses. Each cadet must satisfy the graduation requirements with a set of courses that includes those courses required of all EE majors. If a student has validated a course, no grade for that course is included in the average. If a course is repeated, only the highest final grade earned in that course will be included in the Upper-Division GPA calculation; however, all grades appear on the transcript. A passing grade must be earned for all major courses unless validated. In the capstone senior design course, students creatively apply knowledge to solve challenging real-world problems, often sponsored by Coast Guard units and personnel. Engineering capstone projects generally fall into the following categories: Autonomous Systems and Robotics, Communications and Signal Processing, Cyber-Physical Systems, and Power and Energy. The degree granted is the Bachelor of Science in Electrical Engineering. This program is accredited by ABET, http://www.abet.org.

The Electrical Engineering Major produces graduates who achieve the following Student Outcomes:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

Electrical Engineering Program Educational Objectives

The U.S. Coast Guard Academy Electrical Engineering program produces graduates who, within several years of graduation:

- Demonstrate proficiency in the professional practice of engineering as USCG junior officers.
- Demonstrate intellectual or professional growth as evidenced by post-graduate education, licensing, certification, promotion, and participation in pertinent professional societies.
- Contribute electrical engineering expertise and ethical leadership to U.S. Coast Guard engineering challenges within the framework of current practices for engineering lifecycle management.

EE Major Course Requirements

The following are course requirements for the program. In parenthesis are the credit minimum credit or number of course requirements. A typical degree program of study is also provided.

Core Curriculum Requirements Substitutions for Electrical Engineering Major:

Core Requirement	EE Course Substitution
Third Lab Science Course	5266 (PHY 266) Physics II
7310 (CYS 310) Cyber Technology	1226 (EEC 226) Computer Communications and Networking
3213 (MAT 231) Probability and Statistics	3341 (MAT 341) Probability Theory
8115 (MGT 115) Macroeconomic Principles	8313 (MGT 313) Essentials of Economics for Engineering Majors
2293 (CL 293) Moral, Ethical, and Political Philosophy	2394 (CL 394) Intro to Moral and Ethical Philosophy

Lower Division Required Courses (Minimum 31 Credits)
Students must receive a C or above for 1218, 1220 and 1222.

3117 (MAT 117)	Calculus II	4
	or 3115 (MAT 115) Calc II (V)	4
1118 (CEE 118)	Engineering Mech – Statics	3
1218 (EEC 218)	Elec Engineering I	4
1220 (EEC 220)	Trans to Obj Ori Prog	2
1222 (EEC 222)	Signals, Systems & Trnsfrms	4
1225 (EEC 225)	Digital Circ/Comp Systems	4
1226 (EEC 226)	Computer Comms & Ntwrkng	3.5
3216 (MAT 216)	Ord Diff Equat & Lin Algebra	3.5
3211 (MAT 211)	Multivariable Calculus	3

Upper Division Required Courses (14.5 Credits)
Upper Division courses listed below are required. Additional Upper Division courses are listed within the Major Area Electives, Engineering Elective, and the Mathematics/Science Elective.

1322 (EEC 322)	Linear Circuits	4
1329 (EEC 329)	Digital Signal Process	3
1331 (EEC 331)	Automatic Control Systems	3.5
1422 (EEC 422)	Communication Systems	4

Major Area Electives (2 Courses)

1323 (EEC 323)	Antennas and Propagation	4
1328 (EEC 328)	Software Engineering	4
1420 (EEC 420)	Electric Energy and Machines	3.5
1431 (EEC 431)	Electronic Nav Systems	3
7330 (CYS 330)	Computer and Network Security	4

Engineering Electives (2 Courses)
Engineering elective courses for the EE major are defined as Engineering courses, 1200 level or higher, of 3 credits or greater, other than 1321 (EEC 321) Electric Circuits and Machines, and 1460 (ME 460) Modeling and Control of Dynamic Systems. In addition, 7330 (CYS 330) Computer and Network Security, if not counted as a Major Area Elective, and 7345 (CYS 345) Operating Systems may count as an Engineering Elective. In special cases (and with prior approval by the Electrical Engineering Program Chair), 1439 (EEC 439) Directed Studies in Electrical Engineering may be considered an Engineering Elective.

1206 (CEE 206)	Mech of Materials	3.5
1211 (NAM 211)	Dynamics	3
1323 (EEC 323)	Antennas and Propagation	4
1328 (EEC 328)	Software Engineering	4
1340 (NAM 340)	Fluid Mechanics	3
1351 (ME 351)	Thermodynamics	3
1420 (EEC 420)	Electric Energy and Machines	3.5
1431 (EEC 431)	Electronic Nav Systems	3
7330 (CYS 330)	Computer and Network Security	4
7345 (CYS 345)	Operating Systems	3

Mathematics/Science Elective (1 Course)

3221 (MAT 221)	Linear Algebra	3
3231 (MAT 231)	Linear Optimization	3
3237 (MAT 237)	Discrete Mathematics	3
3343 (MAT 343)	Mathematical Statistics	3
5206 (CES 206)	Chemistry II	4
5330 (MS 330)	Geospatial Sciences I	3.5
5232 (MS 232)	Marine Biology	4
5233 (CES 233)	Environmental Science	3.5
5236 (MS 236)	Oceans I: Air and Sea	4

5367 (PHY 367)	Remote Sensing	3
5368 (PHY 368)	Energy Production	3
5419 (CES 419)	Biochemistry	4
5440 (CES 440)	Microbiology	3
5447 (MS 447)	Polar Oceanography	3.5
5475 (MS 475)	Intro to Geospatial Sciences	3

Capstone Courses (8 Credits)

1426 (EEC 426)	Capstone Proj/EE I	4
1436 (EEC 436)	Capstone Proj/EE II	4

Cadets shall earn a grade of C or better in the following courses: 1218 (EEC 218) Electrical Engineering I, 1220 (EEC 220) Transition to Object Oriented Programming, and 1222 (EEC 222) Signals, Systems, and Transforms.

Electrical Engineering Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
2111	College Composition	3.00*	1118	Engineering Mech – Stat	3.00*
3111	Calculus I	4.00	2163	American Government	3.00*
4111	Swimming	0.50	3117	Calculus II	4.00
5102	Chemistry I	4.00	4115	Personl Movemnt & Dev	1.00
7104	Principles of Programming	3.00*	5162	Physics I	4.00
			6101	Fndamntls of Navigation	4.00*
	Academic Total	**14**		**Academic Total**	**18**
	Semester Total	**14.50**		**Semester Total**	**19**
3/c Year					
1218	Elec Engineering I	4.00	1222	Sgnls, Sys & Trnsfrms	4.00
1220	Trans to Obj Ori Prog	2.00	1225	Digital Circ/Comp Sys	4.00
3216	Ord Diff Equat & Lin Algebra	3.50	1226	Comptr Comms & Ntwks	3.50
4222	Professional Rescuer	2.00	3211	Multivariable Calculus	3.00
5266	Physics II	4.00	6201	Ships & Maritime Sys	3.00
6202	Apps in Navigation	1.00	XXXX	HPE Elective	0.50-1.00
8211	Org Behavior/Ldrship	3.00			
	Academic Total	**17.5**		**Academic Total**	**17.5**
	Semester Total	**19.5**		**Semester Total**	**18/18.5**
2/c Year					
1322	Linear Circuits	4.00	1329	Digital Signal Process	3.00
213X	Cultural Perspectives	3.00+	1331	Automatic Control Sys	3.50
2394	Intro Moral & Ethical Phil	2.00	4303	Personal Defense: MLE Tech	0.50
3341	Probability Theory	3.00	6301	Maritime Watch Officer	4.00
8313	Essentials of Economics	2.00	XXXX	Math/Sci Elective	3.00-4.00
XXXX	Major Area Elective	4.00	XXXX	Engineering Elective	3.00-4.00
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**17/18**		**Academic Total**	**16.5/18.5**
	Semester Total	**17.5/19**		**Semester Total**	**17/19**
1/c Year					
1422	Communication Systems	4.00	1436	Capstone Proj/EE II	4.00
1426	Capstone Proj/EE I	4.00	1493	Engineering Ethics	1.00
2398	Prin CJ & Maritime Op Law*	4.00	2485	Global Challenges *	3.00
XXXX	Major Area Elective	3.00-4.00	5444	Atmospheric & Mar Sci	1.50
XXXX	HPE Elective	0.50-1.00	6401	Professional Maritime Officer	3.00
XXXX	HPE Elective	0.50-1.00	6402	Prof Maritime Officer Lab	1.00
			XXXX	Engineering Elective	3.00-4.00
	Academic Total	**15/16**		**Academic Total**	**16.5/17.5**
	Semester Total	**15.5/16.5**		**Semester Total**	**16.5/17.5**

* These courses may be scheduled during the Fall or Spring Semester.

+ Cultural Perspectives may be scheduled outside of 4/c year.

Government

Program Chair: PROF Ginger Denton, PhD

The Government (GOV) major develops leaders for the 21st Century who think critically about global peoples, civil societies, and political systems and who possess the analytical skills to explore their cultural, theoretical, and jurisprudential foundations. Government Major requirements offer a solid foundation in the political science discipline. Courses in the major enable future leaders to develop in-depth understanding of how political processes, institutions, cultures, and other factors influence the evolution of domestic and international governing norms, systems, institutions, and communities. Cadets may focus their studies in one of three concentrations: International Relations; Politics, Policy, and the Law; and Security Studies. Advisors provide guidance on course selection with regard to a cadet's concentration decision. All cadets in the Government major are required to complete a minimum of one 1/c seminar and a research-based capstone experience. Select cadets in the major may pursue advanced studies, senior theses, and advanced research projects involving original research related to their interests. Courses may not be "double counted". The same course cannot be used to meet multiple graduation or major requirements. Government majors compete successfully for Fulbright, Truman, Gates, and other prestigious post-graduate fellowships. The Government major is an affiliate of the American Political Science Association and sponsors cadet membership in Pi Sigma Alpha, the National Political Science Honor Society.

Government Major Course Requirements

Core Curriculum Courses of Emphasis and GOV Course Substitutions* for Government Major:
Courses of Emphasis within the Core Curriculum, which directly contribute to the cadet's potential for success within the Government major include: 2111 (CL 111), 2163 (GOV 163), and 2293 (CL 293)**. Advisors should monitor their advisee's performance in these courses closely.

*Government majors do not take 2485 Global Challenges as successful completion of 2265 (GOV 265) and 2367 (GOV 367) serve as equivalency. **For cadets who transfer into the GOV major, a passing grade in 2394 (CL 394) Introduction to Moral and Ethical Philosophy, plus a passing grade in either the 1-credit 1493 (CEE 493) Engineering Ethics, 5493 (MS 493) Science Ethics Seminar, or 7294 (CYS 294) Cyber Policy Compliance, and Ethics, will be accepted as meeting the 2293 (CL 293) Moral, Ethical & Political Philosophy Requirement.

Lower Division Required Courses (6 Credits)
Must earn a C or better.

2265 (GOV 265)	Comparative Politics	3
2269 (GOV 269)	National Security Policy	3

Upper Division Required Courses (9 Credits)
Upper Division courses listed below are required. Additional Upper Division courses are listed within the Culture and Languages Studies Requirement and Free Elective Requirement.

2355 (GOV 355)	Public Policymaking	3
2361 (GOV 361)	Political Theory	3
2367 (GOV 367)	International Relations	3

Maritime Studies Requirement (1 Course)
Additional designated courses will be listed by the Program Chair each spring.

2382 (GOV 382)	Politics of the Ocean	3
2392 (GOV 392)	Maritime Studies: Selected Topics	3
2463 (GOV 463)	Maritime Governance	3
5445 (MS 445)	Fisheries Management	3

Law Studies Requirement (1 Course)

2397 (GOV 397)	Constitutional Law and Homeland Security	3
2494 (GOV 494)	International Law	3

All Government majors are also required to complete one 24xx seminar, and one 24xx research/capstone experience. These courses are among those listed in Government Electives below.

Culture and Languages Requirements (Minimum 4 Courses)
All Government majors are required to demonstrate intermediate competency in a language other than English. Enrollment in Spanish courses is determined by placement, not class year. All Government majors must take the Spanish placement exam, available at: https://app.emmersion.ai/link/6d3f961b53. This should be done as early as possible before or during 4/c year to ensure proper placement. Transfers to the major must take the placement exam prior to formal application to the major. Spanish course placement is determined by placement examination. By passing Spanish I/II, Spanish II or a higher-level Spanish course the requirement is met. If a cadet starts in Spanish I, they must take Spanish II to fulfill the language requirement, but Spanish I will count as one of their Culture and Languages Requirements. Cadets who wish to fulfill this requirement in another language through approved Academy exchange programs or through Connecticut College may petition to do so by memo through the Head, Department of Culture and Languages. Specific details outlining the policies for doing so are available through the Department of Government's Lead Advisor. Cadets must fulfill the Culture and Languages requirements with History, Ethics, Philosophy, Literature, Language, Speech, or other Culture & Languages offerings.

Culture and Language Required Courses (2 Courses)

232X (CL 32X)	Literature of Humanity and Conflict Series	3
2236 (CL 236)	Spanish I/II or higher-level Spanish course	3-4

Culture and Language Courses (Minimum 2 Courses)

2242 (GOV 242)	World Civilizations	3
2324 (CL 324)	U.S. Latinos	3
2325 (CL 325)	World Epics and Myths	3
2326 (CL 326)	African American Literature	3
2328 (CL 328)	Public Speaking	3
2335 (CL 335)	Spanish III	3
2337 (CL 337)	Spanish IV	3
2341 (GOV 341)	The Civil War Era	3
2343 (CL 343)	Latin Am Exp: Cultural App	3
2360 (CL 360)	Selected Topics in Philosophy	3
2364 (GOV 364)	Building Healthy Communities	3
2373 (GOV 373)	Religion and Political Philosophy of Islam	3
2429 (CL 429)	The Craft of Creative Writing	3
2439 (CL 439)	Advanced Spanish	3

Government Elective Requirement (Minimum 6 Courses)
2200 Level (Maximum of 2 Courses)

2201 (GOV 201)	Introductory Special Topics in Government	3
2243 (GOV 243)	Modern Diplomacy	3
2267 (GOV 267)	American Congress	3
2272 (GOV 272)	Political Participation	3
2281 (GOV 281)	Intelligence and Democracy	3
2282 (GOV 282)	Intelligence and Cyber Operations	3

2300 Level (Minimum 3 Courses)

2301 (GOV 301)	Special Topics in Government Homeland Security Policy	3
2338 (GOV 338)	Politics of Latin America and the Caribbean	3
2358 (GOV 358)	Politics of North Africa and the Middle East	3
2362 (GOV 362)	Homeland Security Policy	3
2363 (GOV 363)	Contemporary Political Theory	3
2364 (GOV 364)	Building Healthy Communities	3
2369 (GOV 369)	Contemporary U.S. Foreign Policy	3
2370 (GOV 370)	American Presidential Policy	3
2371 (GOV 371)	Area Studies	3
2373 (GOV 373)	The Religion and Political Philosophy of Islam	3
2375 (GOV 375)	Strategic Intelligence	3

2377 (GOV 377)	Politics of China	3
2378 (GOV 378)	Politics of Asia	3
2397 (GOV 397)	Constitutional Law and Homeland Security	3

2400 Level (Minimum 1 Course)
Note: The sixth elective and the research/capstone course cannot be double-counted.

2401 (GOV 401)	Advanced Special Topics in Government	3
2463 (GOV 463)	Maritime Governance	3
2465 (GOV 465)	U.S. Military Policy	3
2467 (GOV 467)	Environmental Policy	3
2468 (GOV 468)	Religion, Politics, and Globalization	3
2472 (GOV 472)	Transnational Threats and Challenges	3
2494 (GOV 494)	International Law	3
2499 (GOV 499)	Building Healthy Communities	6*

*2499 (GOV 499) Advanced Research Project is a two-semester course. One semester may be used as a 2400 Concentration Requirement. The other would fulfill the Capstone requirement.

Free Elective Requirement (Minimum 4 Courses)
Free electives enable Government majors to pursue cognate interests in other CGA academic disciplines or to develop greater depth or breadth within the Government major, including Culture and Languages courses. Government majors should expect to take four Free Electives, to meet the 130 minimum credit requirement to graduate. However, cadets who have accrued additional credits by starting in foundational courses or changing from another major may be able to meet the 130 credit requirement without taking all four Free Electives. Cadets in this situation must still meet all Core and Major requirements but can petition to waive a Free Elective(s) via a memo by the cadet, through the Academic Advisor and Program Chair, to the Dean of the School of Science, Mathematics, and the Humanities.

Capstone Course (Minimum 1 Course)
All Government majors are required to successfully complete a research-based capstone requirement their 1/c Year. Capstone options require a focused research paper or project in the selected Major Concentration. The capstone requirement may be fulfilled through an Advanced Research Project, Senior Thesis, Advanced Studies, or a 2400 level course specifically designated for that purpose. Cadets wishing to be considered for an Advanced Research Project, Senior Thesis or Advanced Studies experience will submit an "Academic Excellence Opportunity" application to the AEO Committee prior to spring break of the cadet's second-class year.

24XX (GOV 4XX)	Capstone-Eligible Course	3
2495 (GOV 495)	Advanced Studies	3
2497 (GOV 497)	Senior Theses	3
2499 (GOV 499)	Advanced Research Projects	6

Descriptions of all capstone experiences appear below:

- *Advanced Research Projects* (2499 – GOV 499) are year-long original research projects for Coast Guard and interagency sponsors undertaken by Government major or interdisciplinary research teams aligned with the Major Concentrations. The Advanced Research Project option is normally limited to cadets with a GPA of 3.0 or higher in the Government Major. Cadets selected for the Advanced Research Project should register for the course during their last two semesters. The two-semester sequence will satisfy the Capstone course requirement and fulfill one of the six Major Concentration requirements.
- *Advanced Studies* (2495 – GOV 495) are one-semester experiences that either include development of a research project for delivery at a national or international student conference or that involve an internship in the spring semester. Cadets selected for this experience will be assigned to work with a Departmental Faculty Advisor. This course will count as the cadet's capstone. The Advanced Studies option is normally limited to cadets with a GPA of 3.0 or higher in the Government major.
- *Senior Theses* (2497 – GOV 497) are one-semester individual research projects in the Major Concentration. Senior Theses require that the cadet submit a request memo routed through the academic advisor, thesis advisors and

Department Head, which includes a/an: research area of interest, CGPA and GPA in the major, identification of two faculty members who agreed to sponsor the work (at least one of whom must be a permanent faculty member with terminal degree), and explanation of how the proposed thesis will fit into the cadet's plan of study. Cadets will normally deliver the final product presentation of the Senior Thesis at the end of year Research Symposium Day. This experience will count as the cadet's capstone. The Senior Thesis option is rarely granted and is limited to cadets with demonstrated sustained interest and aptitude in a specific topic area. Applicants wishing to undertake a Senior Thesis must have a GPA of 3.0 or higher in the Government major.

- *Capstone-eligible courses* - These courses, conducted as research seminars, are normally specifically designated 2400 (GOV 400) level offerings, and will be identified as capstone-eligible in the "Government Major Quick Guide" document promulgated by the Lead Advisor each academic year during registration. Performance expectations and course requirements for cadets utilizing a capstone-eligible course will be determined by the Program Chair.

Government Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
2111	College Composition	3.00*	2163	American Government	3.00*
3111	Calculus I	4.00	2XXX	Culture & Lang Reqrmnt 1	3.00-4.00*
4111	Swimming	0.50	3213	Probability & Statistics	3.00
5102	Chemistry I	4.00	4115	Personl Movemnt & Dev	1.00
6101	Fndamntls of Navigation	4.00*	5162	Physics I	4.00
			8115	Macroeconomic Prin	3.00
	Academic Total	**15**		**Academic Total**	**16/17**
	Semester Total	**15.5**		**Semester Total**	**17/18**
3/c Year					
213X	Cultural Perspectives	3.00+	2265	Comparative Politics	3.00
2269	National Security Policy	3.00	22/23XX	Government Elective 1	3.00
2293	Moral/Ethcl/Pol Phil	3.00	22/23XX	Government Elective 2	3.00
2XXX	Culture & Lang Reqrmnt 2	3.00	3142	Data Explor & Visualiz	3.00
4222	Professional Rescuer	2.00	6201	Ships & Maritime Sys	3.00**
52X6	3rd Lab Science Option	4.00**	6202	Apps in Navigation	1.00**
8211	Org Behavior/Ldrship	3.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**19**		**Academic Total**	**16**
	Semester Total	**21**		**Semester Total**	**16.5/17**
2/c Year					
2355	Public Policymaking	3.00	2361	Political Theory	3.00
2367	International Relations	3.00	23XX	Government Elective 4	3.00
2398	Prin CJ & Maritime Op Law	4.00	23/24XX	Law Requirement	3.00
23XX	Government Elective 3	3.00	22/23XX	Culture & Lang Reqrmnt 3	3.00-4.00
23/24XX	Maritime Studies Reqrmnt	3.00	6301	Maritime Watch Officer	4.00
4303	Personal Defense: MLE Tech	0.50	XXXX	HPE Elective	0.50-1.00
	Academic Total	**16**		**Academic Total**	**16/17**
	Semester Total	**16.5**		**Semester Total**	**16.5/18**
1/c Year					
6401	Professional Maritime Officer	3.00	5444	Atmospheric & Mar Sci	1.50
6402	Prof Maritime Officer Lab	1.00	7310	Intro to Cyber Tech	1.50
23/24XX	Government Elective 5	3.00	24XX	Capstone Requirement	3.00
23/24XX	Culture & Lang Reqrmnt 4	3.00-4.00	24XX	Government Elective 6	3.00
XXXX	Free Elective 1*	3.00-4.00	XXXX	Free Elective 3*	3.00
XXXX	Free Elective 2*	3.00-4.00	XXXX	Free Elective 4*	3.00-4.00
XXXX	HPE Elective	0.50-1.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**16/19**		**Academic Total**	**15/16**
	Semester Total	**16.5/19.5**		**Semester Total**	**15.5/16.5**

* These courses may be scheduled during the Fall or Spring Semester.
** These courses may be taken during the Fall or Spring Semester depending on which Lab Science (5206 or 5266) is requested.

Management

Program Chair: Prof Matthew Keblis, PhD.

The Management (MGT) degree program prepares 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, economics, management, marketing, management of information systems, quantitative methods, and analytics. The program of study culminates with an engaging capstone experience where teams of students are paired with Coast Guard, non-profit and other public-sector clients with a management problem. Students learn the fundamentals of management consulting and draw upon their knowledge of the major business disciplines to scope, analyze, and deliver a management consulting project with a real-world impact. For Major Area Electives other courses may be accepted if explicitly approved in writing by the Department Head prior to the beginning of the semester in which taken. This degree program is accredited by AACSB International – the Association to Advance Collegiate Schools of Business, www.aacsb.edu.

The Management Major produces graduates who:

- Exemplify Leadership. Management graduates are leaders. 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 groups; to function effectively and ethically as a leader, follower, facilitator, or member of a team; and to conduct constructive assessment of self and others.
- Acquire, Integrate, and Expand Business Knowledge. Management graduates are managers. Graduates shall understand and demonstrate the following business competencies: accounting, economics, management, analytics, finance, marketing, international issues, legal and social environment issues, and management of information systems. Graduates shall have developed the motivations 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 knowledge.
- Effectively Communicate. Management graduates are good listeners. 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 differing opinions; and formulate reasoned alternatives and responses.
- Think Critically. Management graduates integrate and apply their leadership ability, business competency, and effective communication skills. 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.

MGT Major Course Requirements

Core Curriculum Requirements and Substitutions for Management Major:

A grade of C- or above is required for 2111 (CL 111), 3213 (MAT 231), and 8211 (MGT 211)

.

Core Requirement	MGT Course Substitution
1104 (EEC 104) Introduction to Computing	8142 (MGT 142) Tools for Business Intelligence

Lower Division Required Courses (12 Credits)

A grade of C- or above is required for 8246 (MGT 246).

8201 (MGT 201)	Intro to Mgmt & Bus	3
8217 (MGT 217)	Microeconomic Principles	3
8241 (MGT 241)	Legal Environ Business	3
8246 (MGT 246)	Financial Accounting	3

Upper Division Required Courses (33 Credits)

Upper Division courses listed below are required. Additional Upper Division courses are listed within the Major Area Elective.

8331 (MGT 331)	Management Info Systems	3

8342 (MGT 342)	Marketing	3
8348 (MGT 348)	Managerial Accounting	3
8349 (MGT 349)	Financial Management	3
8351 (MGT 351)	Research Methods	3
8357 (MGT 357)	Human Resources Mgmt	3
8363 (MGT 363)	Operations Management	3
8366 (MGT 366)	Ldrship/Org Dev/Chg	3
8443 (MGT 443)	Strategic Management	3
8444 (MGT 444)	PMC Prep	3
8445 (MGT 445)	Public Mgmt Consulting	3

Major Area Electives (4 Courses)
Cadets who wish to pursue graduate studies in Information Systems are encouraged to take Software Engineering (1328) as their Major Area Elective in the spring semester of their 1/c year. These students should take either Information Technology in Organizations (8419) or Computer Communications and Networking (1226), plus one more of the other IS related Major Area Electives marked with an asterisk as a free elective. This sequence of courses fulfills the prerequisite undergraduate requirements as suggested by the Special Interest Group for Management Information Systems (SIGMIS).

1226 (EEC 226)	Comp Comms & Network*	3.5
1328 (EEC 328)	Software Engineering*	4
3235 (MAT 235)	Comp Model Languages*	3
7385 (CYS 385)	Cyber Risk Management*	3
8417 (MGT 417)	Investment Theory	3
8418 (MGT 418)	Personal Financial Planning	3
8419 (MGT 419)	Info Technology in Orgs*	3
8429 (MGT 429)	Managerial Psychology	3
8440 (MGT 440)	Federal Budgeting	3
8446 (MGT 446)	Intermediate Financial Acct	3
8447 (MGT 447)	Auditing & Intrnl Cntrl	3
8449 (MGT 449)	Select Topics in IS/DS*	3
8450 (MGT 450)	Select Topics in Mgmt	3
8451 (MGT 451)	International Business Operations	3
8452 (MGT 452)	Contemp Skills for Business Professionals	3
8453 (MGT 453)	Systems Analysis & Design*	3
8458 (MGT 458)	Negt & Conflict Mgmt	3
8460 (MGT 460)	Cost Accounting	3
8461 (MGT 461)	Supply Chain Management	3
8464 (MGT 464)	Business Analytics	3
8468 (MGT 468)	Drctd Studies in Fin/Acct/Ec	3
8469 (MGT 469)	Directed Studies in Mgmt	3
8470 (MGT 470)	Directed Studies in IS/DS*	3

Students on track for success in Management normally maintain a GPA at or above 2.00 and meet the requirements for a C- or higher in foundational coursework, including 2111 (CL 111) College Composition, 3213 (MAT 231) Probability & Statistics, and 8211 (MGT 211) Organizational Behavior and Leadership.

Management Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
2111	College Composition	3.00*	2163	American Government	3.00*
3111	Calculus I	4.00	3213	Probability & Statistics	3.00
4111	Swimming	0.50	4115	Personl Movemnt & Dev	1.00
5102	Chemistry I	4.00	5162	Physics I	4.00
6101	Fndamntls of Navigation	4.00*	8115	Macroeconomic Prin	3.00
			8142	Tools for Bus Intel	3.00
	Academic Total	**15**		**Academic Total**	**16**
	Semester Total	**15.5**		**Semester Total**	**17**
3/c Year					
52XX	Lab Science	4.00**	213X	Cultural Perspectives	3.00
6201	Ships & Maritime Sys	3.00**	2293	Moral/Ethcl/Pol Phil	3.00
6202	Apps in Navigation	1.00**	2398	Prin CJ & Maritime Op Law	4.00
8201	Intro to Mgmt & Bus	3.00	4222	Professional Rescuer	2.00
8211	Org Behavior/Ldrship	3.00	7310	Intro to Cyber Tech	1.50
8217	Microeconomic Prin	3.00	8241	Legal Environ Business	3.00
XXXX	HPE Elective	0.50-1.00	8246	Financial Accounting	3.00
	Academic Total	**17**		**Semester Total**	**17.5**
	Semester Total	**17.5**		**Academic Total**	**19.5**
2/c Year					
6301	Maritime Watch Officer	4.00	4303	Personal Defense: MLE Tech	1.00
8331	Management Info Sys	3.00	8342	Marketing	3.00
8348	Managerial Accounting	3.00	8349	Financial Management	3.00
8351	Research Methods	3.00	8363	Operations & Proj Mgmt	3.00
8357	Human Resources Mgmt	3.00	8366	Ldrship/Org Dev/Chg	3.00
XXXX	HPE Elective	0.50-1.00	XXXX	Major Area Elective	3.00-4.00
	Academic Total	**16**		**Academic Total**	**15/16**
	Semester Total	**16.5/17**		**Semester Total**	**16/17**
1/c Year					
6401	Professional Maritime Officer	3.00	2485	Global Challenges	3.00
6402	Prof Maritime Officer Lab	1.00	5444	Atmospheric & Mar Sci	1.50
8443	Strategic Management	3.00	8445	Public Mgmt Consulting	3.00
8444	PMC Prep	3.00	XXXX	Major Area Elective	3.00-4.00
XXXX	Major Area Elective	3.00-4.00	XXXX	Major Area Elective	3.00-4.00
XXXX	Free Elective	3.00-4.00	XXXX	Free Elective	3.00-4.00
XXXX	HPE Elective	0.50-1.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**16/18**		**Academic Total**	**16.5/19.5**
	Semester Total	**16.5/18.5**		**Semester Total**	**17/20**

* These courses may be scheduled during the Fall or Spring Semester.
** These courses may be taken during the Fall or Spring Semester depending on which Lab Science (5206 or 5266) is requested.

Marine and Environmental Sciences

Program Chair: PROF Karina Mrakovcich, PhD.

The Marine and Environmental Sciences (MES) major focuses on physical, chemical, and biological aspects of the environment with a focus on the ocean. The structure of the major affords students with significant choices where to focus their studies. Specific topics include energy production; meteorology; wind-driven and deep ocean circulation; estuarine processes; survey of marine life, biological productivity; fisheries management; short-range unmanned aircraft systems (SR-UAS) and satellite sensor technology to remotely monitor the Earth; marine geochemistry; chemistry of oil; detection, measurement, and biological effects of pollution; and impacts on 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. Additionally, the role of science in policymaking and science ethics is covered. As a science major, laboratory work is central to the plan of study including field studies on the Thames River in our research vessel, remote sensing developing the technology for student-led space-based environmental monitoring, weather forecasting, computer modeling of the wind-driven ocean circulation, collecting and analyzing environmental data, chemical identification of unknown compounds, identification of marine organisms, analysis of commercial fishing techniques and use of geospatial technologies. If a student has validated a course, no grade for that course is included in the average. If a course is repeated, only the highest final grade earned in that course will be included in the Upper-Division GPA calculation; however, all grades appear on the transcript. Students must attain a GPA of 2.0 or above in all Mathematics and Science Courses. A passing grade must be earned for all major courses unless validated. The student's academic experience culminates in a capstone project where students will reinforce classroom theory with real-world application to tackle complex problems and provide solutions relevant to Coast Guard missions.

The Marine and Environmental Science Major produce graduates who:

- Identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
- Formulate or design a system, process, procedure, or program to meet desired needs.
- Develop and conduct experiments or test hypotheses, analyze, and interpret data and use scientific judgment to draw conclusions.
- Communicate effectively with a range of audiences.
- Understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.
- Function effectively in teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.
- Apply knowledge of chemistry, physics, biology, earth sciences, calculus, and statistics to evaluate impacts on the environment.
- Understand the basic marine and environmental sciences principles and the application of environmental science in policy formulation and environmental resources management.

Marine and Environmental Science Program Educational Objectives

In addition to the Academy's Shared Learning Outcomes, the Marine and Environmental Sciences Program Educational Objectives include producing graduates who within 7 years after graduation:

- Perform effectively in a variety of career paths as Junior Officers in the Coast Guard.
- Provide appropriate environmental protection expertise to the Coast Guard while serving in environmental protection related billets.
- Demonstrate a commitment to intellectual and professional growth through activities and accomplishments such as graduate study, professional licensure, professional society activity, and/or continuing education.

The following concentration tracks are open to all majors:

- Water and Soil
- Mass and Energy
- Environmental Policy
- Geospatial Intelligence

MES Major Course Requirements

Core Curriculum Requirements Substitutions for Marine and Environmental Sciences Major:

Core Requirement	MES Course Substitution
5444 (MS 444) Atmospheric and Marine Sciences	5236 (MS 236) Oceans I: Air and Sea

Lower Division Required Courses (26 Credits)

3117 (MAT 117)	Calculus II	4
3XXX (MAT XXX)	Advanced Math Option	3
5206 (CES 206)	Chemistry II	4
5232 (MS 232)	Marine Biology	4
5236 (MS 236)	Oceans I: Air and Sea	4
5266 (PHY 266)	Physics II	4
XXXX	STEM Elective	3

Upper Division Required Courses (11 Credits)

Upper Division courses listed below are required. Additional Upper Division courses are listed within the Concentration.

5330 (MS 330)	Geospatial Sciences I	3.5
5355 (CES 355)	Env Policy and Law	3
5443 (MS 443)	Marine Ecology	3.5
5493 (MS 493)	Science Ethics Seminar	1

Major Area Concentrations

Complete courses for one of the following Major Area Concentrations:

Environmental Science Concentration

Required Courses (21.5 Credits)

5233 (CES 233)	Environmental Science	3.5
5302 (CES 302)	Organic Chemistry I	4
5312 (CES 312)	Analytical Methods in Chemistry	4
5415 (CES 415)	Fate & Transport of Chemicals in the Environment	3
5419 (CES 419)	Biochemistry	4
5435 (MS 435)	Emergency Management	3

Environmental Science Concentration Tracks

Includes one of the following Tracks or student designed
3 Course Elective Track approved by the Program Chair.

ES – Mass and Energy Track (9 Credits)

1118 (CEE 118)	Engineering Mechanics: Statics	3
1340 (NAM 340)	Fluid Mechanics	3
1351 (ME 351)	Thermodynamics	3

ES –Environmental Policy Track (9 Credits)

2355 (GOV 355)	Public Policymaking	3
2382 (GOV 382)	Politics of the Ocean	3
	Or 2392 (GOV 392) Maritime Studies: Selected Topics	3
2463 (GOV 463)	Maritime Policy and Strategy	3

ES - Environmental Health Track (10 Credits)

5308 (CES 308)	Organic Chemistry II	4
5417 (CES 417)	Toxicology	3
5440 (CES 440)	Microbiology	3

ES - Water and Soil Track (10 Credits)

1309 (CEE 309)	Environmental Engineering I	4
1406 (CEE 406)	Coastal Resiliency	3
1407 (CEE 407)	Environmental Engineering Design II	3

Marine Science Concentration

Required Course (3.5 Credits)

5241 (MS 241)	Oceans II: Land and Sea	3.5

Marine Science Concentration Tracks

Includes two of the following three tracks:

MS – Biological Environmental Track (Minimum 13.5 Credits)

5334 (MS 334)	Fisheries Biology	4
5342 (MS 342)	Bio & Chem Oceanography	3.5
XXXX	Science Elective	3-4
5445 (MS 445)	Fisheries Management	3

MS – Geospatial Intelligence Track (Minimum 13 Credits)

2282 (GOV 282)	Intel & Cyber Ops	3
5367 (PHY 367)	Remote Sensing	3
5430 (MS 430)	Geospatial Sciences II	4
5435 (MS 435)	Emergency Management	3
	Or 5447 (MS 5447) Oceanography	3.5

MS - Physical Oceanography Track (14 Credits)

5338 (MS 338)	Marine Forecasting	3.5
5350 (MS 350)	Ocean Dynamics	3.5
5447 (MS 447)	Polar Oceanography	3.5
5450 (MS 450)	Waves, Tides & Coastal Processes	3.5

Environmental Monitoring Concentration

Required Courses (20 Credits)

5241 (MS 241)	Oceans II: Land and Sea	3.5
5312 (CES 312)	Analytical Methods in Chemistry	4
5350 (MS 350)	Ocean Dynamics	3.5
5367 (PHY 367)	Remote Sensing	3
5368 (PHY 368)	Energy Production	3
53xx or 54xx	Physics Elective	3-4

Environmental Monitoring Concentration Tracks

Includes one of the 3 Course Physical Science Sequence Tracks

EM – Aerospace Track (9 Credits)

1118 (CEE 118)	Engineering Mechanics-Stats	3
1351 (ME 351)	Thermodynamics	3
1433 (NAM 433)	Aerodynamics-Fundamentals and NACA	3

EM – Geospatial Intelligence Track (Minimum 10 Credits)

2282 (GOV 282)	Intel & Cyber Ops	3
5430 (MS 430)	Geospatial Sciences II	4
5435 (MS 435)	Emergency Management	3
	Or 5447 (MS 447) Polar Oceanography	3.5

EM - Physical Oceanography Track (10.5 Credits)

5338 (MS 338)	Marine Forecasting	3.5
5447 (MS 447)	Polar Oceanography	3.5
5450 (MS 450)	Waves, Tides & Coastal Processes	3.5

EM – Systems Track (12 Credits)

1218 (EEC 218)	Electrical Engineering I	4
	Or 1321 (EEC 1321) Electric Circuits and Machines	4
1222 (EEC 222)	Signals, Systems and Transforms	4
1323 (EEC 323)	Antennas and Propagation	4
	Or 1420 (EEC 420) Electrical Energy and Machines	4

Capstone Requirement (5 Credits)
Each student of the MES Major must submit a proposal for and receive approval for their capstone research experience. At the conclusion of this experience, students will provide a summary of their research.

5381 (CYS 381)	Capstone Research Experience 1	1
5480 (MS 480)	Capstone Research Experience 2	3
5481 (MS 481)	Capstone Research Experience 3	1

Geospatial Intelligence (GEOINT) Certificate Program
Cadets may choose to focus their major concentration choices and electives on geospatial intelligence studies. The mission of the Geospatial Intelligence (GEOINT) offering is to prepare students for leveraging geospatial intelligence in maritime operations as leaders in the U.S. Coast Guard. Officers working in all specialty fields must be able to recognize situations when geospatial intelligence can enhance mission success and understand how to locate, evaluate, and analyze geospatial data for solving operational problems. They should also be skilled in communicating with their crew, fellow officers, and chain of command. The program also aims to prepare students for more advanced study and post-military careers in geospatial intelligence and related fields. Following completion of courses in geospatial intelligence, cadets may choose to take an exam to qualify for a Coast Guard competency in this area.

The GEOINT Plan of Study requires completion of the following courses:

Core Required Courses (Minimum 13 Credits)

5330 (MS 330)	Geospatial Science I	3.5
	Or 5475 (MS 475) Introduction to Geospatial Science	3
5367 (PHY 367)	Remote Sensing	3
2282 (GOV 282)	Intelligence and Cyber Operations	3
5430 (MS 430)	Geospatial Science II	4

Electives (1 Course)

5435 (MS 435)	Emergency Management	3
5447 (MS 447)	Polar Oceanography	3.5
5469 (MS 469)	Research in Geospatial Science	3

Capstone (5 Credits)

5381 (MS 381)	Capstone Research I and 5480 Capstone Research II and 5481 (MS 481) Capstone Research III (GEOINT)	5
	Or Summer Internship (GEOINT)	

While the Geospatial Intelligence (GEOINT) Certificate Program is housed in the Marine and Environmental Sciences major, it is open to all students at USCGA. Students in Marine and Environmental Sciences wishing to pursue the GEOINT Certificate Program should enroll in the GEOINT Track within their respective concentration.

Students on track for success in Marine and Environmental Sciences normally maintain a technical GPA at or above 2.00.

Marine and Environmental Sciences - Environmental Science Program of Study

Fall Semester			Spring Semester		
#	**Title**	**Credits**	**#**	**Title**	**Credits**
		4/c Year			
3111	Calculus I	4.00	2111	College Composition	3.00*
3142	Data Explor. and Vis.	3.00	2163	American Government	3.00*
4111	Swimming	0.50	3117	Calculus II	4.00
5102	Chemistry I	4.00	4115	Personl Movemnt & Dev	1.00
6101	Fndamntls of Navigation	4.00*	5162	Physics I	4.00
			5206	Chemistry II	4.00
	Academic Total	**15**		**Academic Total**	**18**
	Semester Total	**16.5**		**Semester Total**	**19**
		3/c Year			
3XXX	Advanced Math Option	3.00	213X	Cultural Perspectives	3.00+
5232	Marine Biology	4.00	4222	Professional Rescuer	2.00
5236	Oceans I: Air and Sea	4.00	5241	Oceans II: Land and Sea	3.50
5266	Physics II	4.00	5330	Geospatial Sciences I	3.50
6202	Apps in Navigation	1.00	6201	Ships & Maritime Sys	3.00
8115	Macroeconomic Prin	3.00	8211	Org Behavior/Ldrship	3.00
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**19**		**Academic Total**	**16.5**
	Semester Total	**19.5/20**		**Semester Total**	**18.5**
		2/c Year			
2394	Intro Moral & Ethical Phil	2.00	2398	Prin CJ & Maritime Op Law	4.00
3213	Probability & Statistics	3.00	4303	Personal Defense: MLE Tech	0.50
5312	Analytl Methods Chem	4.00	5330	Geospatial Sciences I	3.50
5419	Biochemistry	4.00	5355	Environ Policy & Law	3.00
6301	Maritime Watch Officer	4.00	5381	Capstone 1	1.00
XXXX	HPE Elective	0.50-1.00	XXXX	Track Elective 1	3.00-4.00
			XXXX	STEM Elective	3.00-4.00
			XXXX	HPE Elective	0.50-1.00
	Academic Total	**17**		**Academic Total**	**17.5/19.5**
	Semester Total	**17.5/18**		**Semester Total**	**18/20**
		1/c Year			
2485	Global Challenges	3.00	5415	Fate/Transport Chems Env	3.00
5443	Marine Ecology	3.50	5435	Emergency Management	3.00
5480	Capstone 2	3.00	5481	Capstone 3	1.00
XXXX	Track Elective 2	3.00-4.00	5493	Science Ethics Seminar	1.00
XXXX	Free Elective	3.00-4.00**	6401	Professional Maritime Officer	3.00
XXXX	HPE Elective	0.50-1.00	6402	Prof Maritime Officer Lab	1.00
			7310	Intro to Cyber Tech	1.50
			XXXX	Track Elective 3	3.00-4.00
	Academic Total	**15.5/17.5**		**Academic Total**	**16.5/17.5**
	Semester Total	**16/18**		**Semester Total**	**16.5/17.5**

* These courses may be scheduled during the Fall or Spring Semester.
** Given the breadth of study inherent in the Academy's core curriculum, free electives are not required for graduation. Therefore, they can be waived if at least 15 academic credits are taken each semester.

Marine and Environmental Sciences - Marine Science Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
3111	Calculus I	4.00	2111	College Composition	3.00*
3142	Data Explor. and Vis.	3.00	2163	American Government	3.00*
4111	Swimming	0.50	3117	Calculus II	4.00
5102	Chemistry I	4.00	4115	Personl Movemnt & Dev	1.00
6101	Fndamntls of Navigation	4.00*	5162	Physics I	4.00
			5206	Chemistry II	4.00
	Academic Total	**15**		**Academic Total**	**18**
	Semester Total	**15.5**		**Semester Total**	**19**
3/c Year					
3XXX	Advanced Math Option	3.00	213X	Cultural Perspectives	3.00+
5232	Marine Biology	4.00	4222	Professional Rescuer	2.00
5236	Oceans I: Air and Sea	4.00	5241	Oceans II: Land and Sea	3.50
5266	Physics II	4.00	5330	Geospatial Sciences I	3.50
6202	Apps in Navigation	1.00	6201	Ships & Maritime Sys	3.00
8115	Macroeconomic Prin	3.00	8211	Org Behavior/Ldrship	3.00
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**19**		**Academic Total**	**16**
	Semester Total	**19.5/20**		**Semester Total**	**18**
2/c Year					
3213	Probability & Statistics	3.00	2394	Intro Moral & Ethical Phil	2.00
6301	Maritime Watch Officer	4.00	2398	Prin CJ & Maritime Op Law	4.00
XXXX	Track Elective 1	3.00-4.00	4303	Personal Defense: MLE Tech	0.50
XXXX	Track Elective 2	3.00-4.00	5381	Capstone 1	1.00
XXXX	Free Elective	3.00-4.00	XXXX	Track Elective 3	3.00-4.00
XXXX	HPE Elective	0.50-1.00	XXXX	Track Elective 4	3.00-4.00
			XXXX	STEM Elective	3.00-4.00
			XXXX	HPE Elective	0.50-1.00
	Academic Total	**16/19**		**Academic Total**	**16/19**
	Semester Total	**16.5/20**		**Semester Total**	**16.5/20**
1/c Year					
2485	Global Challenges	3.00	5355	Environ Policy & Law	3.00
5443	Marine Ecology	3.50	5481	Capstone 3	1.00
5480	Capstone 2	3.00	5493	Science Ethics Seminar	1.00
XXXX	Track Elective 5	3.00-4.00	6401	Professional Maritime Officer	3.00
XXXX	Track Elective 6	3.00-4.00	6402	Prof Maritime Officer Lab	1.00
XXXX	HPE Elective	0.50-1.00	7310	Intro to Cyber Tech	1.50
			XXXX	Track Elective 7	3.00-4.00
			XXXX	Track Elective 8	3.00-4.00
	Academic Total	**15.5/17.5**		**Academic Total**	**16.5/18.5**
	Semester Total	**16/18.5**		**Semester Total**	**16.5/18.5**

* These courses may be scheduled during the Fall or Spring Semester.
** Given the breadth of study inherent in the Academy's core curriculum, free electives are not required for graduation. Therefore, they can be waived if at least 15 academic credits are taken each semester.

Marine and Environmental Sciences – Environmental Monitoring Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
3111	Calculus I	4.00	2111	College Composition	3.00*
3142	Data Explor. and Vis.	3.00	2163	American Government	3.00*
4111	Swimming	0.50	3117	Calculus II	4.00
5102	Chemistry I	4.00	4115	Personl Movemnt & Dev	1.00
6101	Fndamntls of Navigation	4.00*	5162	Physics I	4.00
			5206	Chemistry II	4.00
	Academic Total	**15**		**Academic Total**	**18**
	Semester Total	**15.5**		**Semester Total**	**19**
3/c Year					
3XXX	Advanced Math Option	3.00	213X	Cultural Perspectives	3.00+
5232	Marine Biology	4.00	4222	Professional Rescuer	2.00
5236	Oceans I: Air and Sea	4.00	5241	Oceans II: Land and Sea	3.50
5266	Physics II	4.00	5330	Geospatial Sciences I	3.50
6202	Apps in Navigation	1.00	6201	Ships & Maritime Sys	3.00
8115	Macroeconomic Prin	3.00	8211	Org Behavior/Ldrship	3.00
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**19**		**Academic Total**	**16**
	Semester Total	**19.5/20**		**Semester Total**	**18**
2/c Year					
3213	Probability & Statistics	3.00	2394	Intro Moral & Ethical Phil	2.00
5312	Analytl Methods Chem	4.00	2398	Prin CJ & Maritime Op Law	4.00
5350	Ocean Dynamics	3.50	4303	Personal Defense: MLE Tech	0.50
5367	Remote Sensing	3.50	XXXX	STEM Elective	3.00-4.00
6301	Maritime Watch Officer	4.00	5368	Energy Production	3.00***
XXXX	HPE Elective	0.50-1.00	5381	Capstone 1	1.00
			XXXX	Physics Seq Elect I	3.00-4.00
			XXXX	HPE Elective	0.50-1.00
	Academic Total	**18**		**Academic Total**	**16/18**
	Semester Total	**18.5/19**		**Semester Total**	**16.5/19**
1/c Year					
2485	Global Challenges	3.00	5355	Environ Policy & Law	3.00
5443	Marine Ecology	3.50	5447	Polar Oceanography	3.00
5450	Waves/Tides/Coast Proc	3.50	5481	Capstone 3	1.00
5480	Capstone 2	3.00	5493	Science Ethics Seminar	1.00
53xx/54xx	Physics Elective	3.00-4.00	6401	Professional Maritime Officer	3.00
XXXX	Physics Seq Elect II	3.00-4.00	6402	Prof Maritime Officer Lab	1.00
XXXX	HPE Elective	0.50-1.00	7310	Intro to Cyber Tech	1.50
			XXXX	Physics Seq Elect III	3.00-4.00
	Academic Total	**19/20**		**Academic Total**	**16.5/17.5**
	Semester Total	**19.5/20.5**		**Semester Total**	**16.5/17.5**

* These courses may be scheduled during the Fall or Spring Semester.

*** Or other course approved by the Program Chair

+ Cultural Perspectives may be scheduled outside of 4/c year.

Mechanical Engineering

Program Chair: PROF Ron Adrezin, PhD, PE

The Mechanical Engineering (ME) major provides a solid foundation for service as a Coast Guard Officer, professional engineer, and/or any further study in Mechanical Engineering or 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 creatively solving real-world problems. If a student has validated a course, no grade for that course is included in the average. If a course is repeated, only the highest final grade earned in that course will be included in the Upper-Division GPA calculation; however, all grades appear on the transcript. A passing grade must be earned for all major courses unless validated. As a senior, students complete two semesters of a capstone project. The capstone is a hands-on 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, http://www.abet.org.

The Mechanical Engineering Major produces graduates who achieve the following Student Outcomes:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.
8. In addition to common Student Outcomes across the School of Engineering and Cyber Systems, the Mechanical Engineering Major has an additional Student Outcome to "Produce graduates who have an ability to develop as leaders in the Coast Guard".

Mechanical Engineering Program Educational Objectives:

The Educational Objectives of the Mechanical Engineering Program are to produce graduates who, within 4-6 years of graduation:

- Attain professional competence as an engineer in a U.S. Coast Guard Operational or Mission Support role.
- Demonstrate evidence of intellectual growth in engineering such as engineering licensure, graduate education, publications and Coast Guard certifications and credentials
- Attain recognition of professional accomplishment as a Coast Guard Officer in any field.

ME Major Course Requirements

Lower Division Required Courses (31 Credits)

Students must attain a C or above for 1118, 1206, 1208 and 1xxx.

1118 (CEE 118)	Engineering Mech - Statics	3
1206 (CEE 206)	Mech of Materials	3.5
1208 (ME 208)	Intr to Mech Engr Desgn	3
XXXX	Dynamics of Machines	3
3117 (MAT 117)	Calculus II	4
3211 (MAT 211)	Multivariable Calculus	3
3216 (MAT 216)	Ord Diff Equat & Lin Algebra	3.5
5162 (PHY 162)	Physics II	4
5206 (CES 206)	Chemistry II	4

Upper Division Required Courses (38 Credits)
Upper Division courses listed below are required. Additional Upper Division courses are listed within the Major Area Elective.

1318 (NAM 318)	Engr Material Science	4
1321 (EEC 321)	Elect Circuits & Machines	4
1340 (NAM 340)	Fluid Mechanics	3
1351 (ME 351)	Thermodynamics	3
1353 (ME 353)	Thermal Systems Design	3
1437 (ME 437)	Engineering Experimentation	3
1440 (ME 440)	Machine Design	4
1446 (ME 446)	Mechanical Engr Dsgn	4
1459 (ME 459)	Heat Transfer	3
1460 (ME 460)	Mod & Cntrl of Dyn Sys	3
1480 (ME 480)	Design Project Management	4

Major Area Electives (Minimum 3 Credits)
A major area elective may consist of any Mechanical Engineering technical elective or any technical upper level, 13xx (ME 3XX) or 14xx (ME 4XX) required course for another Engineering program course of study or other courses as specifically approved by the Mechanical Engineering Program Chair. Cadets may make requests for course substitutions in writing. Examples of technical electives include (and are not limited to) 1461 (ME 461) Mechatronics, 1466 (ME 466) Heating Ventilation and Air Conditioning, and 1457 (NAME 457) Small Craft Design.

Capstone (8 Credits)

1446 (ME 446)	Mechanical Engr Dsgn	4
1480 (ME 480)	Design Project Management	4

Cadets in 4/c and 3/c years will be closely monitored by the Program Chair if they do not maintain a minimum 2.00 GPA in Engineering (1000 series), Science (5000 series), and Mathematics (3000 series) courses and earn a grade of C or better in the following courses: 1118 (CEE 118) Engineering Mechanics - Statics, 1206 (CEE 206) Mechanics of Materials, 1208 (ME 208) Introduction to Mechanical Engineering Design, and 1xxx (Variable, specific new number not provided) Dynamics of Machines. The Program Chair will craft a plan for the cadet's academic success as needed. This may involve a recommended Change of Major to ensure the cadet is tracking to meet graduation requirements.

Mechanical Engineering Program of Study

Fall Semester			Spring Semester		
#	**Title**	**Credits**	**#**	**Title**	**Credits**
		4/c Year			
1101	Intro to Experiential Engr I	1.00#	2163	American Government	3.00*
1118	Engineering Mech – Stat	3.00*	3117	Calculus II	4.00
2111	College Composition	3.00*	4115	Prin Fitness/Wellness II	1.00
3111	Calculus I	4.00	5162	Physics I	4.00
4111	Swimming	0.50	6101	Fndamntls of Navigation	4.00*
5102	Chemistry I	4.00	7104	Principles of Programming	3.00
	Academic Total	**15**		**Academic Total**	**18**
	Semester Total	**15.5**		**Semester Total**	**19**
		3/c Year			
1206	Mech of Materials	3.50	1208	Intro Mech Engr Design	3.00
1416	SelTpcs ME Lab	1.00	1321	Elec Cir & Machines	4.00
3211	Multivariable Calculus	3.00	1415	SelTpcs in ME	3.00
5266	Physics II	4.00	3216	ODE & Lin Algebra	3.50
6201	Ships & Maritime Sys	3.00	4222	Professional Rescuer	2.00
6202	Apps in Navigation	1.00	5206	Chemistry II	4.00
8211	Org Behavior/Ldrship	3.00			
XXXX	HPE Elective	0.50-1.00			
	Academic Total	**18.5**		**Academic Total**	**17.5**
	Semester Total	**19/19.5**		**Semester Total**	**19.5**
		2/c Year			
1318	Engr Material Science	4.00	1440	Machine Design	4.00
1340	Fluid Mechanics	3.00	1459	Heat Transfer	3.00
1351	Thermodynamics	3.00	2394	Intro Moral & Ethical Phil	2.00
213X	Cultural Perspectives	3.00+	3213	Probability & Statistics	3.00
6301	Maritime Watch Officer	4.00	4303	Personal Defense: MLE Tech	0.50
XXXX	HPE Elective	0.50-1.00	XXXX	Major Area Elective	3.00-4.00
			XXXX	HPE Elective	0.50-1.00
	Academic Total	**17**		**Academic Total**	**17/18**
	Semester Total	**17.5/18**		**Semester Total**	**17.5/19**
		1/c Year			
1353	Thermal Systems Design	3.00	1446	Mech Engr Design	4.00
1437	Engr Experimentation	3.00	1493	Engineering Ethics	1.00
1480	Design Project Mgt	4.00	2398	Prin CJ & Maritime Op	4.00
6401	Professional Maritime Off	3.00	2485	Global Challenges	3.00
6402	Prof Maritime Officer Lab	1.00	5444	Atmospheric & Mar Sci	1.50
8313	Essentials of Economics	2.00	7310	Intro to Cyber Tech	1.50
XXXX	HPE Elective	0.50-1.00	XXXX	Major Area Elective	3.00
	Academic Total	**17**		**Academic Total**	**18**
	Semester Total	**17.5/18**		**Semester Total**	**18**

* These courses may be scheduled during the Fall or Spring Semester.
+ Cultural Perspectives may be scheduled outside of 4/c year.
# Encouraged but not required.

Naval Architecture and Marine Engineering

Program Chair: CDR Michael Daeffler, P.E.

The Naval Architecture and Marine Engineering (NA&ME) major directly relates to a variety of CG missions and career paths including naval engineering and marine safety engineering (Prevention) and graduates have had successful careers in all CG missions in addition to the private sector. The NA&ME major emphasizes the solution of open-ended design and analysis problems, teamwork, creativity, and effective communication. Hands-on projects interweave throughout the curriculum as they form a part of almost every course via formal labs, projects or in-class exercises.

The curriculum culminates in a senior design or capstone project encompassing 12 credits of students' academic load during 1/c year. This design presents the ultimate design synthesis challenge – the team-based ship design project encompassing all major components of a vessel from the vessel's arrangements to its propulsion systems. This year-long project fulfills the greater CG's and maritime industry's strategic needs, often exploring emerging applications to missions and capabilities.

Supported by the NA&ME faculty, cadets in the program regularly attend professional engineering functions and participate in projects and summer internships that produce tangible and timely results for the Coast Guard. Recent examples include the development of new stability assessment methods for towing and fishing vessels which significantly improved safety and design modifications to Coast Guard cutters currently under construction. Focusing on the Coast Guard's core assets, the NA&ME Department produces graduates who will provide technical leadership for the future.

Students must attain a GPA of 2.0 or above in all Mathematics, Science and Engineering Courses. A passing grade must be earned for all major courses unless validated. This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

The Naval Architecture and Marine Engineering Major produces graduates who:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

Naval Architecture and Marine Engineering Program Educational Objectives:

The U.S. Coast Guard Academy Naval Architecture and Marine Engineering program produces graduates who, within several years of graduation:

- Demonstrate competency in professional practice in U.S. Coast Guard Naval Engineering or Marine Safety Engineering positions.
- Demonstrate intellectual and professional growth such as post-graduate education, licensing, certification, and participation in pertinent professional societies.
- Contribute to NA&ME expertise to the solution of U.S. Coast Guard engineering challenges, specifically including the design, construction, safety, operation, and repair of U.S. Coast Guard and commercial vessels.

NA&ME Major Course Requirements

Core Curriculum Requirements Substitutions for Naval Architecture and Marine Major:
No substitutions are required. However, students are required to attain a C or above in 6201.

Lower Division Required Courses (33 Credits)
Students are required to attain a C or above for 1118, 1206, and 1242.

1118 (CEE 118)	Engineering Mech – Statics	3
1206 (CEE 206)	Mech of Materials	3.5
1211 (NAM 211)	Dynamics	3
1241 (NAM 241)	Laboratory in Naval Arch	1
1242 (NAM 242)	Applied Nav Arch & Mar Eng	4
3117 (MAT 117)	Calculus II	4
3211 (MAT 211)	Multivariable Calculus	3
3216 (MAT 216)	Ord Diff Equat & Lin Algebra	3.5
5162 (PHY 162)	Physics II	4
5206 (CES 206)	Chemistry II	4

Upper Division Required Courses (36 Credits)
All 13XX and 14XX level courses required by the Major (or approved substitutes for any of these courses) are considered as Upper Division Courses.

1318 (NAM 318)	Engr Material Science	4
1321 (EEC 321)	Electric Circuits and Machines	4
1340 (NAM 340)	Fluid Mechanics	3
1351 (ME 351)	Thermodynamics	3
1355 (NAM 355)	Marine Engineering	3.5
1356 (NAM 356)	Ship Structures	3.5
1442 (NAM 442)	Prin of Ship Design	4
1444 (NAM 444)	Ship Design/Sys Intgr	3
1453 (NAM 453)	Ship Propulsion Design	4
1459 (ME 459)	Heat Transfer	3
1493 (CEE 493)	Engineering Ethics	1

Capstone (12 Credits)

1442 (NAM 442)	Prin of Ship Design	4
1444 (NAM 444)	Ship Design/Sys Intgr	4
1453 (NAM 453)	Ship Propulsion Design	4

Cadets in 4/c and 3/c years will be closely monitored by the Program Chair if they do not maintain a minimum 2.00 GPA in Engineering (1000 series), Science (5000 series), and Mathematics (3000 series) courses and earn a grade of C or better in the following courses: 1118 (CEE 118) Engineering Mechanics - Statics, 1206 (CEE 206) Mechanics of Materials, 1242 (NAM 242) Applied Nav Arch & Mar Eng, and 6201 (NAM 201) Ships and Maritime Systems. The Program Chair will craft a plan for the cadet's academic success as needed. This may involve a recommended Change of Major to ensure the cadet is tracking to meet graduation requirements.

Naval Architecture and Marine Engineering Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
1101	Intro to Experiential Eng I	1.00#	1102	Intro to Experiential Eng II	1.00#
2163	American Government	3.00*	2111	College Composition	3.00*
3111	Calculus I	4.00	1118	Engineering Mech – Stat	3.00*
4111	Swimming	0.50	3117	Calculus II	4.00
5102	Chemistry I	4.00	4115	Personl Movemnt & Dev	1.00
6101	Fndamntls of Navigation	4.00*	5162	Physics I	4.00
			7104	Principles of Programming	3.00
	Academic Total	**16**		**Academic Total**	**18**
	Semester Total	**16.5**		**Semester Total**	**19**
3/c Year					
1206	Mech of Materials	3.50	1211	Dynamics	3.00
1241	Laboratory in Naval Arch	1.00	1242	Applied Nav Arch & Mar Eng	4.00
3216	Ord Diff Equat & Lin Algebra	3.50	3211	Multivariable Calculus	3.00
4222	Professional Rescuer	2.00	5206	Chemistry II	4.00
5266	Physics II	4.00	6202	Apps in Navigation	1.00
6201	Ships & Maritime Sys	3.00	8313	Essentials of Economics	2.00
8211	Org Behavior/Ldrship	3.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**18**		**Academic Total**	**17**
	Semester Total	**20**		**Semester Total**	**17.5/18**
2/c Year					
1318	Engr Material Science	4.00	1321	Elec Cir & Machines	4.00
1340	Fluid Mechanics	3.00	1355	Marine Engineering	3.50
1351	Thermodynamics	3.00	1356	Ship Structures	3.50
3213	Probability & Statistics	3.00	1459	Heat Transfer	3.00
4303	Personal Defense: MLE Tech	0.50	213X	Cultural Perspectives	3.00
6301	Maritime Watch Officer	4.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**17**		**Academic Total**	**17**
	Semester Total	**17.5**		**Semester Total**	**17.5/18**
1/c Year					
1442	Prin of Ship Design	4.00	1444	Ship Dsgn/Sys Intgr	4.00
1453	Ship Propulsion Design	4.00	1493	Engineering Ethics	1.00
2398	Prin CJ & Maritime Op	4.00	2485	Global Challenges	3.00
2394	Intro Moral & Ethical Phil	2.00	5444	Atmospheric & Mar Sci	1.50
XXXX	Free Elective	1.00-4.00	6401	Professional Maritime Off	3.00
XXXX	HPE Elective	0.50-1.00	6402	Prof Maritime Officer Lab	1.00
			7310	Intro to Cyber Tech	1.50
	Academic Total	**15/18**		**Academic Total**	**15**
	Semester Total	**15.5/19**		**Semester Total**	**15**

* Theses course may be scheduled during the Fall or Spring Semester.
+ Cultural Perspectives may be scheduled outside of 4/c year.
# 1101and 1102 Intro to Experiential Engineering I/II are optional but encouraged and by default scheduled.

Operations Research and Data Analytics

Major Program Chair: PROF Ian Frommer, PhD
Service Courses Program Chair: PROF Arundhati Bagchi Misra, PhD.

The Operations Research and Data Analytics (ORDA) major provides graduates with a background in mathematics, probability, statistics, deterministic and non-deterministic modeling, and computer programming and 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 Data Analytics highlights how mathematics and computers can be used to analyze complex problems and improve decision-making. Students must attain a GPA of 2.0 or above in all Mathematics Courses.

One of the highlights of the Operations Research and Data Analytics major is the cadet capstone experience. The capstone designated courses are designed to cover multiple aspects of the analytics project/problem framework and will require the 1/c cadet to draw upon multiple aspects from across the Operations Research & Data Analytics curriculum. The capstone designated course offerings include opportunities for cadets to work as consulting teams on projects submitted by various Coast Guard units. In addition to providing consulting benefits to the Coast Guard, these projects strengthen the connectivity between the Academy, the service, and the field of operations research. Below are recent cadet capstone experiences with the sponsoring office shown in parentheses:

- Coast Guard MK Station Staffing Analysis (USCG Headquarters Office of Requirements and Analysis)
- USCG District 9 Aviation Search and Rescue Plan (USCG Air Station Traverse City)
- Recreational Boating Safety Analysis (USCG Headquarters Office of Auxiliary and Boating Safety)
- Workforce Skills Management (USCG Headquarters Office of Strategic Workforce Panning and HR Analytics)
- Fisheries Enforcement by Quantifying Risk (USCG Sector Southeastern New England)

The Department of Mathematics sponsors a Summer Internship Program for 1/c cadets who have displayed exceptional abilities both academically and militarily. This program provides an opportunity for the educational and professional growth of these cadets as they perform operations research work for the Coast Guard or other government agencies. Recent internships have been offered at: the National Security Agency, the Coast Guard Office of Requirements and Analysis (CG-771), the Coast Guard Office of Strategic Workforce Planning and HR Analytics (CG-126), the Coast Guard Special Missions Training Center, and Massachusetts Institute of Technology (MIT) Lincoln Labs.

The Operations Research and Data Analytics Major produce graduates who:

- Understand and demonstrate proficiency in all mathematics coursework required for their degree.
- Effectively communicate mathematical information in many contexts including reading, writing, listening, and presenting.
- Interpret, critically analyze, model, and provide solutions to relevant problems that may involve mathematics, data analysis, software applications, or rigorous proofs.
- Appreciate and practice effective team membership and leadership, constructive assessment of self and others, and lifelong learning.
- Appreciate and practice the use of mathematics and operations research techniques and perspectives to improve processes and solve applied problems for the Coast Guard.

ORDA Major Course Requirements

Core Curriculum Requirements Substitutions for Operations Research and Data Analytics Major:

Core Requirement	ORDA Course Substitution
3142 (MAT 142) Data Exploration and Visualization	3235 (MAT 235) Comp Model Languages
3213 (MAT 231) Probability and Statistics	3341 (MAT 341) Probability Theory

Lower Division Required Courses (7 Credits)

3117 (MAT 117)	Calculus II	4
3211 (MAT 211)	Multivariable Calculus	3

Upper Division Required Courses (44 Credits)

Upper Division courses listed below are required. Additional Upper Division courses are listed within the Major Area Elective. If a course is retaken, both the original and the retaken credits/grades are included in the Upper Division GPA calculation. If more than two Major Area Electives are taken, the two with the highest grades earned are used for the Upper Division GPA calculation.

3201 (MAT 201)	Exploratory Data Analysis	2
3221 (MAT 221)	Linear Algebra	3
3231 (MAT 231)	Linear Optimization	3
3235 (MAT 235)	Comp Model Languages	3
3237 (MAT 237)	Discrete Mathematics	3
3238 (MAT 238)	Algorithms w/Applications	3
3333 (MAT 333)	Network & Nonlin Optim	3
3334 (MAT 334)	Intermediate Det Models	3
3336 (MAT 336)	Information Systems	3
3341 (MAT 341)	Probability Theory	3
3343 (MAT 343)	Mathematical Statistics	3
3447 (MAT 347)	Linear Regression	3
3449 (MAT 449)	Statistical Learning	3
3453 (MAT 453)	Decision Models	3
3463 (MAT 463)	Simulation w/Risk Analysis	3

Major Area Electives (Minimum 2 Courses)

Courses which emphasize the application or theory of mathematics, statistics, computer analysis or operations research. Such courses are typically taken in the Department of Mathematics and must be documented and approved by the Major Program Chair or the Mathematics Department Head.

Capstone (5 Credits)

3470 (MAT 470)	Operations Analysis Preparation*	1
3471 (MAT 471)	Operations Analysis	4
	or 3473 (MAT 473) Problem Solving with Operations Research	4

*Unless a waiver is granted in writing by the Major Program Chair or the Mathematics Department Head**.**

Students on track for success in Operations Research and Data Analytics normally maintain a technical GPA at or above 2.00.

Operations Research and Data Analytics Program of Study

Fall Semester			Spring Semester		
#	Title	Credits	#	Title	Credits
4/c Year					
2111	College Composition	3.00*	3117	Calculus II	4.00
2163	American Government	3.00*	4115	Personl Movemnt & Dev	1.00
2293	Moral/Ethcl/Pol Phil	3.00*	5162	Physics I	4.00
3111	Calculus I	4.00	6101	Fndamntls of Navigation	4.00*
4111	Swimming	0.50	8115	Macroeconomic Prin	3.00*
5102	Chemistry I	4.00			
	Academic Total	**17**		**Academic Total**	**15**
	Semester Total	**17.50**		**Semester Total**	**16**
3/c Year					
3211	Multivariable Calculus	3.00*	3201	Exploratory Data Analysis	2.00
3221	Linear Algebra	3.00	3231	Linear Optimization	3.00
3235	Comp Model Languages	3.00	3237	Discrete Mathematics	3.00
52XX	Lab Science	4.00	3238	Algorithms w/Applications	3.00
8211	Org Behavior/Ldrship	3.00	4222	Professional Rescuer	2.00
XXXX	HPE Elective	0.50-1.00	6201	Ships & Maritime Sys	3.00
			6202	Apps in Navigation	1.00
	Academic Total	**16**		**Academic Total**	**15**
	Semester Total	**16.5/17**		**Semester Total**	**17**
2/c Year					
2398	Prin CJ & Maritime Op	4.00	213X	Cultural Perspectives	3.00
3333	Network & Nonlin Optim	3.00	3334	Intermediate Det Models	3.00
3336	Information Systems	3.00	3343	Mathematical Stats	3.00
3341	Probability Theory	3.00	3347	Linear Regression	3.00
XXXX	Major Area Elective	3.00-4.00*	6301	Maritime Watch Officer	4.00
4303	Personal Defense: MLE Tech	0.50	33XX	Techniques of Data Science	1.00
XXXX	HPE Elective	0.50-1.00	XXXX	HPE Elective	0.50-1.00
	Academic Total	**16/17**		**Academic Total**	**17**
	Semester Total	**17/18.5**		**Semester Total**	**17.5/18**
1/c Year					
2485	Global Challenges	3.00*	34XX	Capstone Course	4.00
3449	Statistical Learning	3.00	5444	Atmospheric & Mar Sci	1.50
3453	Decision Models	3.00	6401	Professional Maritime Off	3.00
3463	Simulatn w/Risk Anlys	3.00	6402	Prof Maritime Officer Lab	1.00
3470	Operations Analysis Prep	1.00	7310	Intro to Cyber Tech	1.50
XXXX	Free Elective	3.00-4.00***	XXXX	Major Area Elective*	3.00-4.00*
XXXX	HPE Elective	0.50-1.00	XXXX	Free Elective **	3.00-4.00***
	Academic Total	**16/17**		**Academic Total**	**17/19**
	Semester Total	**16.5/17.5**		**Semester Total**	**17/19**

* These courses may be taken during the Fall or Spring Semester.
** This course may be taken during the Fall or Spring Semester depending on which Lab Science is requested.
*** These courses may be taken during the Fall or Spring Semester. Given the breadth of study inherent in the Academy's core curriculum, free electives are not required for graduation. Therefore, they can be waived if at least 15 academic credits are taken each semester.

Courses

In this version of the catalog, a Future Course number is listed on the second line of each offering.

Special Course Offerings

0920 Directed Studies in Interdisciplinary Topics

(Future Course # - PROV 320)

Individual or group study in interdisciplinary topics or topics which do not coincide directly with one of the USCGA's academic programs or departments.
Credit Hours: 1.00 - 3.00
Format: Directed Studies
Prerequisites: Topic Dependent
Registration Restrictions: Approval of the Vice Provost for Academic Affairs (or delegate)
Projected Offering: Fall and Spring

0925 Scholar's Project

(Future Course # - PROV 425)

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: None
Registration Restriction: Provost Council Approval
Projected Offering: Spring

0940 Peer Tutoring

(Future Course # - PROV 340)

Satisfactory/Unsatisfactory Option
This one-credit course introduces 3/c though 1/c cadets to the theory and practice of tutoring, learning strategies across disciplines, and ways to guide students to become independent learners. Enrollment in the course requires cadets to complete 8 hours of training, to tutor for 8 hours, and to maintain a tutoring log. A course grade of satisfactory will be awarded to those who complete the requirements. Advisor approval is required prior to enrolling in the course. The course may be repeated up to six times.
Credit Hours: 1.00
Format: Seminar, workshops, tutorials
Prerequisites: None
Registration Restriction: Faculty recommendation for courses to be tutored.
Projected Offering: Fall and Spring

0941 Peer Tutoring

(Future Course # - PROV 441)

Letter- grade Option
This one-credit course introduces 3/c though 1/c cadets to the theory and practice of tutoring, learning strategies across disciplines, and ways to guide students to become independent learners. Enrollment in the course requires cadets to complete 8 hours of training, to maintain a tutoring log, to complete 24 hours of tutoring, and to complete response essays at the end of the semester. A letter grade will be awarded to those who complete the requirements. Advisor approval is required prior to enrolling in the course. The course may be repeated up to six times.
Credit Hours: 1.00
Format: Seminar, workshops, tutorials
Prerequisites:
Registration Restriction: Faculty recommendation for courses to be tutored.
Projected Offering: Fall and Spring

Department of Chemical and Environmental Sciences

5102 Chemistry I
(Future Course # - CES 102)
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: None
Projected Offering: Fall

5206 Chemistry II
(Future Course # - CES 206)
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 gases, physical properties of solutions, chemical kinetics, chemical equilibrium, acids and bases, nuclear chemistry, organic chemistry, and biochemistry.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5102
Projected Offering: Spring

5208 Chemistry II (Advanced)
(Future Course # - CES 208)
The follow on course to Chemistry I. 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 environmental science or engineering, and particularly ideal for Marine and Environmental Sciences and Engineering majors.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5102
Registration Restriction: Program Chair approval
Projected Offering: Spring

5233 Environmental Science
(Future Course # - CES 233)
This course is a survey of important concepts in Environmental Science. Topics will include water, soil, and atmospheric issues, focusing in on the chemical and biological implications and the effects on ecosystems. The overall objective of the course is to use scientific analysis in understanding the environment.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: None
Projected Offering: Spring

5302 Organic Chemistry I
(Future Course # - CES 302)
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: 5206
Projected Offering: Spring

5308 Organic Chemistry II
(Future Course # - CES 308)
Organic Chemistry II focuses on understanding the structure and functionality of organic compounds and learning the mechanisms of selected reactions including electrophilic aromatic substitutions, Friedel-Crafts, acyl substitution, acetal formation, formation of imines, aldol and Claisen reactions. Laboratory stresses advanced synthesis and characterization techniques used in modern organic chemistry laboratories, including one- and two-dimensional NMR techniques and mass spectrometry.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5302
Projected Offering: Fall

5312 Analytical Methods in Chemistry
(Future Course # - CES 312)
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: 5206
Projected Offering: Spring

5355 Environmental Policy and Law
(Future Course # - CES 355)
The course will offer students of environmental science an introduction to the underpinnings of why we protect our environment, the public policymaking process in an environmental science context, and an overview of the laws and policies most relevant to the Coast Guard's marine environmental protection mission. A significant portion of the course will focus on legal and policymaking cases that illustrate environmental policy concepts.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Spring

5399 Directed Studies in Chemistry
(Future Course # - CES 399)
Individual program of advanced readings or laboratory projects in chemistry.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 5206
Registration Restriction: Approval of Instructor and CES Department Head
Projected Offering: Fall and Spring

5415 Fate and Transport of Chemicals in the Environment
(Future Course # - CES 415)

An investigation of 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: None
Registration Restrictions: Open to Marine Science Majors. Instructor's approval for non-majors
Projected Offering: Fall

5417 Toxicology
(Future Course # - CES 417)
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: 5206 or equivalent
Projected Offering: Spring – Odd Year

5419 Biochemistry
(Future Course # - CES 419)
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: 4.00
Format: Lecture
Prerequisites: None
Projected Offering: Spring – Odd Year

5421 Projects in Chemistry
(Future Course # - CES 421)
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:
Registration Restriction: Approval of Project Advisor and the Program Chair
Projected Offering: Fall and Spring

5429 Research in Chemistry
(Future Course # - CES 429)
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:
Registration Restriction: Approval of Research Advisor and the Program Chair
Projected Offering: Fall and Spring

5440 Microbiology
(Future Course # - CES 440)
A survey of microbiology and the applications of microbiology to human health. Topics include cell structure and function, metabolism, growth, genetics, and classification of prokaryotes, fungi, and viruses. Special attention will be paid to microbiological agents that are potential weapons of mass destruction, such as *Bacillus anthracis* (anthrax), *Yersinia pestis* (plague), *Francisella tularensis* (tularemia), and *Variola major* (smallpox). The mechanisms of human immunological Defense will also be covered.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Spring – Even

5441 Petroleum and Oil Spill Science
(Future Course # - CES 441)
A broad and thorough study of the petroleum production technology and oil spill science. Topics will include petroleum exploration, production, and shipping systems. The composition of crude oil and petroleum products will be studied as will a basic description of measurement techniques for studying crude oil, distilled petroleum products, and oil found in the environment including oil spill fingerprinting techniques. The sources, fate and transport of petroleum pollution will be studied in depth, including modeling techniques used by modern pollution responders. Oil spill clean-up technology will be described, and nationally prominent guest speakers will describe the current state of oil spill response and science.
Credit Hours: 3.00
Format: Class
Prerequisites: 5206
Projected Offering: Spring

5489 Selected Topics in Chemistry
(Future Course # - CES 489)
Description: Specialized topics in chemistry not covered in any other courses.
Credit Hours: 3.00
Format: TBD
Prerequisites: TBD
Projected Offering: Fall and Spring

Department of Civil and Environmental Engineering

1118 Engineering Mechanics – Statics
(Future Course # - CEE 118)
Develop an understanding of the principles of statics and the ability to construct a free body diagram. Introduce the concepts of forces, resolution and composition of forces and moments as applied to free body diagrams. Solve equilibrium problems (two-dimensional and three-dimensional) involving trusses, frames, beams, and other rigid bodies. Understand the concept of internal forces in members and be able to draw the shear and moment diagrams for beams. Apply the laws of dry friction in equilibrium analyses. Understand properties of areas and be able to calculate centroids and moments of inertia for areas. Develop critical thinking skills necessary to formulate strategies for solving engineering problems.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Co-requisite: 3111
Projected Offering: Fall and Spring

1201 Environmental Stewardship Seminar
(Future Course # - CEE 201)
This is a 1-credit interdisciplinary seminar course, the theme and contents of which change every year. The focus is on

exposing students to the fundamental principles of environmental stewardship in relation to the key engineering, scientific, and governance factors driving current environmental issues. The course is in the form of a seminar with an emphasis on the use of case studies and practical applications to reinforce the importance of concepts. It is co-taught by faculty from the School of Engineering & Cyber Systems and the School of Science, Mathematics, & the Humanities.
Credit Hours: 1.00
Format: Class/Laboratory
Prerequisites: None
Projected Offering: Spring

1206 Mechanics of Materials
(Future Course # - CEE 206)
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: 1118 (with a grade of C or higher), 3117
Projected Offering: Fall and Spring

1210 Materials for Civil and Construction Engineers
(Future Course # - CEE 210)
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. The course includes a pavement design project and two field trips.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1118 (with a grade of C or higher)
Projected Offering: Spring

1304 Soil Mechanics
(Future Course # - CEE 304)
This course involves the study of the engineering characteristics of soils. The fundamentals of soil behavior, its use as a construction material, effect of water movement through soil including flow nets, effective stress principle, one-dimensional settlement analysis, shear strength, lateral earth pressure, soil bearing capacity for shallow foundations and stability of slopes are covered.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1118 (with a grade of C or higher)
Projected Offering: Fall

1309 Environmental Engineering I
(Future Course # - CEE 309)
Introduction to the field of environmental engineering. Students learn the fundamental scientific principles used by environmental engineers to understand, analyze, and design systems and apply these principles to the study of water quality engineering, solid waste, hazardous waste, and air pollution. Legal, political, and ethical aspects of the field are examined throughout the course. The laboratory component of the course is designed to provide students with experimental design, data analysis, and technical report writing. The laboratory also allows students to learn about water quality parameters, analytical techniques, and educates them on proper interpretation and use of environmental quality data.

Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5206
Projected Offering: Fall

1310 Environmental Engineering Lab
(Future Course # - CEE 310)
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: 5206, USAFA CE 362
Projected Offering: Fall

1311 Soil Mechanics Lab
(Future Course # - CEE 311)
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 in the spring semester.
Credit Hours: 1.00
Format: Class
Prerequisites: 1118 (with a grade of C or higher), AFA CE 390
Projected Offering: Spring

1312 Transportation Engineering
(Future Course # - CEE 312)
Transportation is essential for all economic, recreational, and social activities. The field of transportation engineering encompasses several modes including rail, water, highways, and air. Transportation engineers are responsible for the planning, design, operation, and maintenance of such infrastructure. This is an introductory course on the fundamentals and concepts of transportation engineering with a focus on the highway mode of transportation. Special emphasis is placed on the planning, design, operation, safety, and maintenance of highway infrastructure. Students will be exposed to the tools and concepts required to analyze and design transportation systems.
Credit Hours: 3.00
Format: Class
Prerequisites: 1118 (with a grade of C or higher), 3111, 5162
Projected Offering: Spring

1313 Steel Design
(Future Course # - CEE 313)
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
(Future Course # - CEE 317)
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, slope deflection, and moment distribution. Computer applications included.

Credit Hours: 3.00
Format: Class
Prerequisites: 1206 (with a grade of C or higher)
Projected Offering: Fall

1395 Projects in Engineering
(Future Course # - CEE 395)
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:
Registration Restriction: Approval of Advisor and Major Coordinator
Projected Offering: Fall and Spring

1401 Construction Project Management
(Future Course # - CEE 401)
This course provides an introduction to the management practices of the construction industry, specifically focusing on how projects are planned and executed. Topics include design and contracting methods, reading, and understanding construction drawings and specifications, scheduling, cost estimation, life-cycle cost analysis, construction productivity, and engineering ethics. Contemporary issues of the industry, including sustainable design, will be analyzed. This course also serves to introduce students to the Senior Research and Design (Capstone) Project. Students will initiate the design process by defining the project's problem statement and conducting research to support their solution. Students from outside the CE major will be expected to produce equivalent work.
Credit Hours: 4.00
Format: Class/Project
Prerequisites:
Registration Restriction: 1/c Cadets Only
Projected Offering: Fall

1402 Civil Engineering Design
(Future Course # - CEE 402)
The Senior Research and Design (Capstone) course for the Civil Engineering major requires students to plan, design, and manage a complex open-ended civil engineering project. Students apply a variety of knowledge from a broad range of technical, managerial, and humanities coursework to produce solutions that recognize professional responsibilities when considering the economic, societal, and environmental aspects of global challenges. Students will produce engineering calculations, construction drawings, project schedules, cost estimates 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
(Future Course # - CEE 404)
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

1406 Coastal Resiliency
(Future Course # - CEE 406)
Due to variability in atmospheric and ocean temperatures, extreme precipitations, global-sea level rise, and the like, science and engineering communities are faced with the challenge of ensuring that our infrastructures can withstand the loading imposed by these previously unaccounted for conditions. Assessing the risk of damage (as well as failure and loss of life) and forecasting the probability of occurrence of these variations are particularly challenging. Ecosystems, infrastructure in coastal regions, and waterfront facilities are particularly vulnerable. This course addresses ways of incorporating science into engineering practice and provides exposure to the best practices used to promote infrastructure resiliency.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Spring

1407 Environmental Engineering II
(Future Course # - CEE 407)
This course applies fundamental concepts from environmental engineering, hydrology, and fluid mechanics to the analysis and design of systems for water distribution, storm water/wastewater collection, and water and wastewater treatment. Water and wastewater treatment are not covered separately in this class. Rather, systems are grouped based on the type of process (biological, chemical, or physical). This approach recognizes that many systems are used in both water and wastewater treatment and that the underlying concepts are the same regardless of the application.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Spring

1409 Water Resources Engineering
(Future Course # - CEE 409)
This course offers a basic introduction to the field of Water Resources Engineering. Topics include surface and groundwater hydrology, rainfall-runoff analysis, reservoir and river routing, probability and frequency analysis, water excess management/control, and watershed management.
Credit Hours: 3.00
Format: Class
Prerequisites: 1407 or permission of the Instructor
Projected Offering: Spring

1411 Reinforced Concrete Design
(Future Course # - CEE 411)
This course provides students with the fundamental theory and application of reinforced concrete design in buildings. Detailed coverage of behavior and design of singly and doubly reinforced concrete beams, T-beams, slabs, beam-columns, and spread footings. Additional topics: placing of reinforcement, bar cutoffs, bonds, and deflections. Design and detailing based on current ACI 318 building code. The course includes Excel programming, analysis and design of various components of a multi-story building, and the design, construction and testing of a full-scale reinforced concrete beam.
Credit Hours: 3.00
Format: Class
Prerequisites: 1210, 1317
Projected Offering: Fall

1414 Structural Design for Extreme Events
(Future Course # - CEE 414)

Consistent with homeland security concerns, the 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

1418 Selected Topics in Civil Engineering
(Future Course # - CEE 418)
This course will explore topics in civil engineering to expand upon the basic curriculum at the Academy. Instructors will select topics from subjects such as structural, environmental, geotechnical, and construction engineering. 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: 3.00
Format: Class
Prerequisites: Varies according to the specific topic
Projected Offering: Fall and Spring

1419 Directed Studies in Civil Engineering
(Future Course # - CEE 419)
Individual Projects in Civil Engineering involving reading, design, analysis, or applications. Oral briefing and final research report are required.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites:
Registration Restriction: Permission of Project Advisor and Civil Engineering Program Chair
Projected Offering: Fall and Spring

1491 Fundamentals of Engineering Exam Review
(Future Course # - CEE 491)
This course, offered as a review, guides 1/c cadets in 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 are major specific.
Credit Hours: 1.00
Format: Class
Prerequisites:
Registration Restriction: 1/c Engineering Major
Projected Offering: Fall

1493 Engineering Ethics
(Future Course # - CEE 493)
Description: This course builds upon ethical theory taught in 2394 Introduction to Moral & Ethical Philosophy and applies this theory specifically to engineering applications through case studies. Historical cases are taken primarily from scholarly literature on engineering ethics. Familiarizing students with Engineering Codes of Ethics is a primary goal of this course.
Credit Hours: 1.00
Format: Class
Prerequisites: 2394

Projected Offering: Spring

Department of Culture and Languages

2101 Introduction to College Communications
(Future Course # - CL 101)
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). The course also emphasizes public speaking and requires formal and informal speeches.
Credit Hours: 3.00
Format: Class
Prerequisites:
Registration Restriction: Placement assessment administered by English faculty
Projected Offering: Fall

2111 College Composition
(Future Course # - CL 111)
Provides an introduction to principles of academic writing, emphasizing development of analytical reading skills and application of rhetorical strategies. The course covers style, principles of research, documentation, revision, synthesis, and cultural, informational, and critical literacies.
Credit Hours: 3.00
Format: Class
Prerequisites:
Registration Restriction: Placement assessment administered by English faculty
Projected Offering: Fall and Spring

2131 American Social Movements
(Future Course # - CL 131)
This course is one of several offerings that fulfill the Core Curriculum Cultural Perspective requirement. This course reviews how groups use legislative and judicial processes of the government to secure rights and promises guaranteed under the Constitution and the Bill of Rights.
Credit Hours: 3.00
Format: Lecture/Discussion
Prerequisites: None
Projected Offering: Fall and Spring

2132 United States Ethnic Literature
(Future Course # - CL 132)
This course is one of several offerings that fulfill the Core Curriculum Cultural Perspective requirement. This particular course examines ethnic voices in U.S. literature, and the ways in which authors have addressed their cultural identity through their works. Students will engage in a variety of formal and informal writing and speaking exercises.
Credit Hours: 3.00
Format: Lecture/Discussion
Prerequisites: None
Projected Offering: Spring

2133 Introduction to Latin America
(Future Course # - CL 133)
This course is one of several offerings that fulfill the Core Curriculum Cultural Perspective requirement. This particular course introduces students to the cultures and societies of Latin America, through the exploration of their literature, film, and

visual arts. By studying a wide selection of short stories, film productions, and art works, it surveys the region from colonial times to the present, focusing on key issues and relevant aspects of the Latin American world.
Credit Hours: 3.00
Format: Lecture/Discussion
Prerequisites: None
Projected Offering: Fall and Spring

2136 Native American Perspectives
(Future Course # - CL 136)
This course is one of several offerings that fulfil the Core Curriculum Cultural Perspectives requirement. This course will examine the relationship between the United States government and Tribal nations from the 17th century through present day. It highlights the role Native Americans played in the development of the United States. An interdisciplinary combination of short stories, electronic sources, film productions, and art will provide the foundation for examining Indigenous cultures.
Credit Hours: 3.00
Format: Lecture
Prerequisites: None
Projected Offering: Fall and Spring

2235 Spanish I
(Future Course # - CL 235)
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: None
Projected Offering: Fall

2236 Spanish I/II
(Future Course # - CL 236)
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: https://app.emmersion.ai/link/6d3f961b53. Password may be obtained by contacting either Dr. Rivero or Dr. Waid in the Department of Humanities.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: None
Registration Restriction: Placement Exam administered by Culture and Languages department
Projected Offering: Spring

2237 Spanish II
(Future Course # - CL 237)
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

2242 World Civilizations
(Future Course # - CL 242)
Exposes cadets to grand forces that shape human civilization as we know it, while parsing out thematic

similarities/differences across cultures, time and space. The course explores development of religion; concepts of security vs. freedom; role of government; evolution of economic systems; definition of citizen; relationship between human society and the environment; development of science and technology; communication/exchange between cultures; globalization/urbanization.
Credit Hours: 3.00
Format: Lecture/Discussion
Prerequisites: Either of 2131, 2132, or 2133
Projected Offering: Fall – Even Years

2293 Moral, Ethical, and Political Philosophy
(Future Course # - CL 293)
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: None
Projected Offering: Fall and Spring

2324 U.S. Latino Literature
(Future Course # - CL 324)
This course fulfills the literature requirement for Government Majors. This course examines how U.S. Latinos have been portrayed in American literature and film and. how Latino fiction, poetry, drama, and essays are influenced by conflicts in the U.S., Latin America, and the Caribbean.
Credit Hours: 3.00
Format: Class
Prerequisites: 2111 and one of the following: 2131, 2132, or 2133
Projected Offering: Spring – Odd

2325 Epics and Myths
(Future Course # - CL 325)
This course fulfills the literature requirement for Government Majors. This course explores how war, revolutions, and social conflicts have involved citizens of diverse cultures: Chinese, Egyptian, Greek, Hebrew, Nordic, Native American, Roman, and others. Discussions examine the humanistic side of military and personal conflicts through these early and modern narratives. Drawing from literature outside the traditional Western canon primarily, these studies emphasize the ways narratives unite and divide culture while touching upon politics, ethnicity, and mythology. Using media (film, art, and Music) and literature (short stories, essays, epics, and plays), the course supports an analysis of the past and its intersection with present global cultures.
Credit Hours: 3.00
Format: Class
Prerequisites: 2111 and one of the following: 2131, 2132, or 2133
Projected Offering: Spring – Even

2326 African American Literature
(Future Course # - CL 326)
This course fulfills the literature requirement for Government Majors. This course examines how conflicts involving African Americans have been portrayed in African-American literature.
Credit Hours: 3.00
Format: Class
Prerequisites: 2111 and one of the following: 2131, 2132, or 2133
Projected Offering: Fall – Even

2328 Public Speaking
(Future Course # - CL 328)
Provides instruction and experience in principles of oral communication, focusing on developing public speaking skills and delivering speeches related to contemporary topics.
Credit Hours: 3.00
Format: Class
Prerequisites: 2111 and one of the following: 2131, 2132, or 2133
Projected Offering: Spring

2329 Literature and History of the Jazz Age
(Future Course # - CL 329)
Book-ended by the Great War and the Great Depression, the Jazz Age was a period marked by change. Using the interdisciplinary approaches of periodical studies, this course historicizes and explores the new literature, music, and art that was often commented on and disseminated through early twentieth century magazines that reflected the turbulent dynamics of the modern era. For the Government major this course will count as a Culture & Language requirement or a Free Elective.
Credit Hours: 3.00
Format: Class
Prerequisites: 2111
Projected Offering: Spring

2331 Coast Guard Spanish
(Future Course # - CL 331)
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 – Even

2335 Spanish III
(Future Course # - CL 335)
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: https://app.emmersion.ai/link/6d3f961b53.
Credit Hours: 3.00
Format: Class
Prerequisites: 2236 or 2237
Projected Offering: Fall

2336 Conversational Spanish
(Future Course # - CL 336)
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, pronunciation, and grammatical sophistication.
Credit Hours: 1.00
Format: Class
Prerequisites: 2335 or equivalent
Projected Offering: Spring – Odd

2337 Spanish IV
(Future Course # - CL 337)

Continuation of Spanish III.
Credit Hours: 3.00
Format: Class
Prerequisites: 2335
Projected Offering: Spring

2341 The Civil War Era
(Future Course # - CL 341)
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; the interrelationship of social, economic, political, military, and diplomatic factors in the war; Reconstruction, constitutional change, and the status of African Americans in postwar America. Assignments include a significant research paper.
Credit Hours: 3.00
Format: Class
Prerequisites: 2163
Projected Offering: Fall – Odd Years

2343 The Latin American Experience
(Future Course # - CL 343)
This course offers a panoramic view of Latin American issues, from pre-Hispanic cultures to the present. Weekly discussions of current affairs will allow cadets to make connections between the past and the present of Latin America. For students with sufficient fluency in Spanish (see 2344 course description for details), this course can be complemented with a one-credit course conducted in Spanish and taught simultaneously to further explore the topics discussed in class.
Credit Hours: 3.00
Format: Class
Prerequisites: Either 2131, 2132, or 2133
Projected Offering: Spring

2344 Introduction to Latin America: Literature, Film and Visual Art
(Future Course # - CL 344)
This is a one-credit course conducted entirely in Spanish that complements the three-credit course The Latin American Experience: A Cultural Approach (2343). It is aimed at students currently enrolled in the three-credit course but also at students who want to enhance their knowledge of Spanish and Latin American culture. Besides further exploring the topics discussed in the three-credit class, students will be able to practice and improve their Spanish communication skills. In order to take this course, students must fulfill one of these language requirements: a) a minimum of a low-intermediate level of Spanish – Spanish III (2335) course offered at CGA or equivalent; b) a score in the Spanish placement test that indicates a low-intermediate level of Spanish or above; c) native/heritage speakers; d) instructor's permission.
Credit Hours: 1.00
Format: Class
Prerequisites: 2335 or equivalent, or Instructor approval
Projected Offering: Spring

2360 Selected Topics in Philosophy
(Future Course # - CL 360)
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: 2293 or 2394
Projected Offering: Spring

2373 The Religion and Political Philosophy of Islam
(Future Course # - CL 373)
This course introduces Islam by exploring its historical development, with a particular emphasis on Islamic theology and philosophy, up to and including contemporary developments. Students will become familiar with the origin and development of Islam, with the unity and diversity of Islam, with classical Islamic philosophy and theology, with the rise and fall of Islamic dynasties and empires, and with the rise of fundamentalist Islam. Students will explore key contemporary issues within Islam, especially the issues of war, women, and democracy, and will examine predominantly Islamic nations in light of what they have studied.
Credit Hours: 3.00
Format: Seminar
Prerequisites: None
Projected Offering: Spring – Even Years

2379 Study of the Koran
(Future Course # - CL 379)
In this 1-credit course, students will read the entire Koran, in addition to an easy secondary source which helps to explain the Koran. Topics discussed will include differences in translations, views regarding the nature of the Koran, the importance of revelation order, different interpretations, and interpretive strategies (including the debate over abrogation) and the relation of the Koran to other sacred scriptures. There are no prerequisites for this course, which does not presuppose any background in Islam. This course is normally taken by non-Government majors; Government majors may take it only with instructor permission.
Note: Cadets may take either 2373 or 2379 but may not take both.
Credit Hours: 1.00
Format: Seminar
Prerequisites: None
Projected Offering: Spring – Even Years

2394 Introduction to Moral and Ethical Philosophy
(Future Course # - CL 394)
Examination of a few major 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 respect for the place of reasoned argument in the treatment of ethical problems, particularly within the field of military ethics.
Credit Hours: 2.00
Format: Seminar
Prerequisites: None
Projected Offering: Fall and Spring

2429 The Craft of Creative Writing
(Future Course # - CL 429)
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 comments. Grading criteria will mostly be based on students' ability to use literary tools (e.g., metaphor, setting, irony, and more) in their own creative works.
Credit Hours: 3.00
Format: Class
Prerequisites: 2111
Projected Offering: Fall or Spring

2439 Advanced Spanish
(Future Course # - CL 439)
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

Department of Electrical Engineering and Computing

1104 Introduction to Computing
(Future Course # - EEC 104)

The world is full of questions - many of which cannot be answered without the aid of computing resources. This course explores the fundamental aspects of computer-based problem solving (ex. modeling and algorithms) and engages students in solving real world problems reflecting a diverse array of fields spanning mathematics, engineering, and the sciences (including Coast Guard applications). Solving these problems will reinforce quantitative reasoning skills and teach students fundamental programming concepts using Excel and MATLAB. By the end of this course, students will be able to extend the foundational knowledge acquired to future learning in computer programming and solving more complex problems of any academic discipline.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: No longer offered.

1218 Electrical Engineering I
(Future Course # - EEC 218)

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 (1225), Antennas and Propagation (1323) and Linear Circuits (1322).
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 3115 or 3117
Corequisite: 1212
Projected Offering: Fall

1220 Transitions to Object Oriented Programming
(Future Course # - EEC 220)

Building upon the procedural and high-level programming introduced in I2C, this course launches into the world of Object Oriented Programming and Design using the lower level language of C++. Key concepts of OOP are covered including classes, properties, methods, constructors, destructors, overloading, and inheritance. This treatment is conducted within the Linux operating system to expand the students' exposure to another operating system and in preparation for further study of Operating Systems, Computer & Network Security, and potential use in Capstone Projects.
Credit Hours: 2.00
Format: Class
Prerequisites: 1104 or 1105 or Permission of Instructor
Projected Offering: Fall

1222 Signals, Systems and Transforms
(Future Course # - EEC 222)

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. This course builds upon the background gained in Electrical Engineering I (1218) and Analytical Methods in Engineering (1212) and prepares students for taking Linear Circuits (1322), Digital Signal Processing (1329) and Communication Systems (1422).
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1218 or 1321 and 1212 or 3215
Projected Offering: Spring

1225 Digital Circuits and Computer Systems
(Future Course # - EEC 225)
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 the 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: 1104, 1105, or Permission of Instructor
Projected Offering: Spring

1226 Computer Communications and Networking
(Future Course # - EEC 226)
This course is an introduction to computer communications and networks and examines the application, transport, network, link, and physical layers of the OSI reference model. Such topics as the Web (including HTTP), E-mail (including SMTP), the Domain Name System (DNS), Transport Layer (UDP and TCP), IPv4/IPv6, Routing, and Media Access Control protocols are all discussed and experienced in lab. The course concludes with a brief overview of additional topics such as wireless and mobile networks. Laboratory work also introduces the students to network administration including the analysis of network communications at the hardware and logical levels.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: None
Projected Offering: Spring

1321 Electric Circuits and Machines
(Future Course # - EEC 321)
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 and Spring

1322 Linear Circuits
(Future Course # - EEC 332)
This course examines the design of filters in both continuous and discrete time, highlighting the relationships between poles and zeros of transfer functions and the resulting frequency responses of filters. The course makes extensive use of computers for the design and analysis of filters. Students use state of the art simulation tools and lab equipment to measure the frequency responses of the filters designed and constructed. Class and lab time reinforce real-world challenges such as non-ideal operational amplifier limitations for analog filters, and sampling rate limitations for digital filters. The course final

project focuses on the design and implementation of analog or digital filters for a specific design application.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1218 (with a grade of C or higher), 1222 (with a grade of C or higher)
Projected Offering: Fall

1323 Antennas and Propagation
(Future Course # - EEC 323)
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 analyze a problem or specification requirement and craft a solution using computer modeling.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1218 (with a grade of C or higher), 3211, 5266
Projected Offering: Fall

1328 Software Engineering
(Future Course # - EEC 328)
Software Engineering builds upon the programming skills learned in the prerequisite courses to a comprehensive understanding of object-oriented programming and design in a modern application programming language in the contexts of the Software Engineering discipline. Class time focuses on such software engineering topics as modeling, planning, requirements, architecture, design, implementation, testing, maintenance, evaluation, and improvement. The lab focuses on using industry best practices to design and implement object-oriented software applications, possibly including web/mobile presentation and/or database data tiers. The course concludes with a significant team software engineering assignment that provides an opportunity to put what has been learned into practice.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1220 (with a grade of C or higher) or 3235
Projected Offering: Spring

1329 Digital Signal Processing
(Future Course # - EEC 329)
This course develops fundamental DSP concepts to support follow-on investigations into more advanced signal processing applications. Topics such as sampling theory, quantization, digital filters, Z-domain analysis, Discrete (and Fast) Fourier Transforms, plus spectral estimation, provide a foundation to learn about more advanced applications such as speech processing (modeling, compression, recognition, and synthesis), digital audio processing, adaptive noise cancelation, and digital image processing (2-D filtering and compression). An integrated approach of theory and hands-on learning is used. Student mini-projects based on MATLAB (or DSP hardware) plus weekly homework are used to reinforce classroom theory and application.
Credit Hours: 3.00
Format: Class
Prerequisites: 1222 (with a grade of C or higher), 1322
Projected Offering: Spring

1331 Automatic Control Systems
(Future Course # - EEC 331)
This course presents the fundamental concepts of modeling, analysis, and controller design in the frequency and time domains. For modeling linear systems, this course introduces the principles of transfer function, state space, and reduction of multiple subsystems. Analysis of stability and steady state error is presented. Proportional, integral, and derivative controllers are designed using root locus and frequency response techniques. The laboratory exercises are based on applying course concepts to real world applications. An introduction to digital control systems is presented as time permits.

Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1218 (with a grade of C or higher) and 1222 (with a grade of C or higher)
Projected Offering: Spring

1420 Electric Energy and Machines
(Future Course # - EEC 420)
Principles and applications of electrical power systems, energy storage and electromechanical conversion including machines such as motors and generators. Topics include 3-phase power, transformers, induction motors, synchronous machines, DC machines, electrical power distribution, energy, and power electronics. Laboratory experiments include transformers, testing rotating machinery, and practical applications of power electronics. The course covers the theory and principles of shipboard power systems and technologies including hybrid systems.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1218 (with a grade of C or higher)
Projected Offering: Fall

1421 Industrial Control System Security
(Future Course # - EEC 421)
Description: The course will cover the fundamentals of Industrial Control Systems and Security with emphasis on models and types of Industrial Control Systems (SCADA, ICS hardware, Programmable Logic Controllers (PLCs)). We will also discuss ICS networks and protocols, control logic software development, Human Machine Interface (HMI) development for ICS, ICS security, firewalls and common ICS vulnerability assessments.
Credit Hours: 3.00
Format: Lecture/Lab
Prerequisites:
Projected Offering: Spring

1422 Communication Systems
(Future Course # - EEC 422)
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 (with a grade of C or higher), 1322 and 3341
Projected Offering: Fall

1426 Capstone Projects in Electrical Engineering I
(Future Course # - EEC 426)
This is the first of two capstone courses in Electrical 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 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:
Registration Restriction: 1/c EE major or EE Program Chair approval
Projected Offering: Fall

1431 Electronic Navigation Systems
(Future Course # - EEC 431)
This course is an engineering study of major electronic navigation systems used throughout the world for positioning, navigation, and timing (PNT). The course begins with a linear algebraic presentation of the mathematics of positioning for "ranging type" PNT systems. Electronic navigation signals and systems are compared in both time and frequency domains, and are examined in the contexts of accuracy, availability, integrity, and vulnerability. Specific systems and augmentations considered are NAVSTAR GPS (and augmentations such as the Wide Area Augmentation System and Differential GPS), eLoran, plus aviation systems such as ILS, VOR, and DME. Other possible topics include: Kalman Filtering, Inertial Navigation, Indoor Navigation, GLONASS, Galileo, and BeiDou.
Credit Hours: 3.00
Format: Class
Prerequisites: (1104 or 1105) and (1212 or (3221 and 3215)) 1218 or 1321 or Permission of the Instructor
Projected Offering: Spring

1436 Capstone Projects in Electrical Engineering II
(Future Course # - EEC 436)
This is the second senior-year capstone course in Electrical Engineering and completes the cadet's electrical 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 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 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
(Future Course # - EEC 439)
Individual or group study of topics involving design, analysis, or applications of electric and electronics devices, systems, or principles. Cadets may repeat this course for credit with a different topic.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites:
Registration Restriction: EE Program Chair approval
Projected Offering: Fall and Spring

1489 Selected Topics in Electrical Engineering
(Future Course # - EEC 489)
This course will explore topics in electrical engineering that expand upon the basic curriculum at the Academy. 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

7218 Fundamentals of Information Security
(Future Course # - CYS 218)
Fundamentals of Information Security is designed to provide an introduction to information security, information assurance, and cyber systems. The Course will help students to begin to develop a common lexicon and to start to delve into the threats to information systems, the risk those threats pose to systems, the vulnerabilities that may be exploited, and the mitigations to those vulnerabilities.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Fall

7238 Introduction to Cryptography
(Future Course # - CYS 238)
This course is a comprehensive introduction to modern applied cryptography. It explores a deep understanding of how modern cryptographic schemes work while presenting the mathematical concepts required as needed. Assignments are designed to be very hands-on. The main goal of this course is to make a student conversant in most of the modern cryptographic schemes and the mathematics upon which their security is based.
Credit Hours: 3.00
Format: Class
Prerequisites: 3117 and 3237
Projected Offering: Fall

7294 Cyber Policy, Compliance, and Ethics
(Future Course # - CYS 294)
The world of cyber is complex and full of questions. This course is designed to delve into some of these questions and challenge students to explore their value system in a digitally connected world. The course is designed in two parts. Part one provides students with some understanding of information assurance in the context and the myriad laws, rules, regulations, and guidelines that impact compliance. Part two provides students an opportunity to build on their foundation in ethics by applying lessons learned in the cyber domain. This course will give students a chance to reflect on the social and professional impacts of computer technology by focusing on the rules and the ethical issues faced in our evolving cyber world.
Credit Hours: 2.00
Format: Class
Prerequisites: 2394 or 2293
Projected Offering: Spring

7310 Introduction to Cyber Technology
(Future Course # - CYS 310)
Upon completion of this course, the successful student will have gained an understanding of the basic principles used in many of the Coast Guard's common Cyber systems. The following topics are covered: information theory, computer systems and networks, Cyber security principles, and an introduction to select maritime electronic navigation and communication systems. Class will meet three times each week for half a semester.
Credit Hours: 1.50
Format: Class/8-Week
Prerequisites: None
Projected Offering: Fall and Spring

7330 Computer and Network Security
(Future Course # - CYS 330)
Extending the basic knowledge gained in the Cyber Systems curriculum, this course provides students with hands-on experience with computer and network security. Threats, vulnerabilities, exploits, and mitigations are examined within the context of a computer as well as the network. The role of cryptography in cybersecurity is explored. Students study the principles of confidentiality, integrity and availability and work hands on with such modern security techniques as hashes, firewalls, intrusion detection and prevention, public key infrastructure, and transport layer security.

Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1226 (with a grade of C or higher) and 7218 (with a grade of C or higher)
Corequisites: 7238 and 7345
Projected Offering: Fall

7345 Operating Systems
(Future Course # - CYS 345)
This course examines important problems in operating system design, implementation, and security. The operating system provides an established, convenient, and efficient interface between user programs and the hardware of the computer on which they run. It is also responsible for sharing resources (e.g., CPU, disks, and networks), providing common services needed by many different programs (e.g. file and print services), and protecting individual programs from interfering with one another. The course will start with a brief historical perspective of the evolution of operating systems followed by introduction of OS structures and components of most operating systems. The course will then proceed to evaluate the trade-offs that can be made between performance and functionality during the design and implementation of an operating system. Particular emphasis will be given to two major OS subsystems: process management (processes, threads, CPU scheduling, synchronization, and deadlock) and memory management (segmentation, paging, swapping). In the lab portion of the class, cadets will work with an operating system to enforce the lessons learned in the class.
Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 1220 (with a grade of C or higher)
Projected Offering: Fall

7381 Database Systems
(Future Course # - CYS 381)
This course comprises three broad areas of intellectual inquiry: Part 1 focuses on introductory concepts and real-life applications of databases. Part 2 familiarizes the student with vulnerabilities and security issues of database management systems (DBMS). Part 3 concentrates on the design and development of databases and their security needs along with a few concepts in advanced DBMS and the structured query language (SQL).
Credit Hours: 3.00
Format: Class
Prerequisites: 1104, 1105, or 8331
Projected Offering: Fall

7385 Cyber Risk Management
(Future Course # - CYS 385)
Cyber Risk Management is designed to introduce students to Systems Engineering concepts to assess risks of cyber related vulnerabilities in the Maritime Transportation System (MTS) and Coast Guard C5I systems. The course will help students to understand how computers and cyber dependent technologies in large-scale systems throughout the Coast Guard and on commercial vessel and in ports enable the MTS to operate, as well as, how exploitation, misuse, or failure could disrupt the national defense and homeland security. This course will cover the Security Risk Assessment, Security Program Management, and Cybersecurity Planning & Management knowledge units from the DHS/NSA CAE Cyber Defense designation. This course will culminate in an innovative project normally themed in concert with the annual Maritime Risk Symposium.
Credit Hours: 3.00
Format: Class
Prerequisites: 7218 (with a grade of C or higher) and 8453
Projected Offering: Spring

7426 Capstone Projects in Cyber Systems I
(Future Course # - CYS 426)
Team-based original undergraduate research projects entailing cyber field and/or applied research. Project requires a major academic commitment to the design, implementation, and/or assessment of cyber challenges, systems, security, strategies,

policies, programs, and/or capabilities. Project also requires development of independent research competencies. Oral briefings and final research reports are required. Cadet projects are supervised jointly by Cyber Systems Capstone Coordinator and faculty advisor.
Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites:
Registration Restriction: 1/c Cyber Systems Major or CYS Program Chair approval
Projected Offering: Fall

7436 Capstone Projects in Cyber Systems II
(Future Course # - CYS 436)
Continuing team-based original undergraduate research projects entailing cyber field and/or applied research. Project requires a major academic commitment to the design, implementation, and/or assessment of cyber challenges, systems, security, strategies, policies, programs, and/or capabilities. Project also requires development of independent research competencies. Oral briefings and final research reports are required. Cadet projects are supervised jointly by Cyber Systems Capstone Coordinator and faculty advisor.
Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites: 7426
Projected Offering: Spring

7478 Projects in Cyber Systems
(Future Course # - CYS 478)
Projects under the direct supervision of a faculty member. The projects can be direct participation in cyber 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. Project proposals must be submitted in writing for approval using the form from the registrar prior to the beginning of the semester. Final written report required. Cadets may repeat this course for credit for different work.
Credit Hours: 1.00
Format: Project
Prerequisites: Depends on Subject Matter
Projected Offering: Fall and Spring

7479 Directed Studies in Cyber Systems
(Future Course # - CYS 479)
Individual or group study in Cyber Systems topics (including devices, systems, and principles) involving reading, design, analysis, or applications. Directed Studies proposals must be submitted in writing for approval using the form from the registrar prior to the beginning of the semester. A final research report is required. Cadets may repeat this course for credit provided new material is researched.
Credit Hours: 1.00 – 3.00
Format: Directed Study
Prerequisites: Depends on Subject Matter
Projected Offering: Fall and Spring

7489 Selected Topics in Cyber Systems
(Future Course # - CYS 489)
This course provides instruction on topics in Cyber Systems that expand upon the basic curriculum at the Academy. Instructors will select topics from various aspects of the cyber domain. This course will meet for at least 50 minutes per credit hour per week and cadets are expected to spend an additional two to three hours per credit hour per week learning about this topic. Cadets may repeat this course for credit with a different topic.
Credit Hours: 1.00 – 4.00
Format: Class
Prerequisites: Depends on Subject Matter

Projected Offering: Fall and Spring

7491 Cybersecurity Certification Exam Review
(Future Course # - CYS 491)
This course, offered as a review, guides 1/c cadets in the Cyber Systems major through a series of topics with the goal of assisting them in their preparation for a specific Cybersecurity Certification exam. Because this exam is a major step in professional credentialing, all 1/c Cyber Systems cadets are encouraged to take this course and its corresponding exam. Course review topics follow guidelines established by the certification organization. Topics reviewed may include Security and Risk Management, Security Architecture and Engineering, Communication and Network Security, Identity and Access Management, Security Assessment and Testing, and Security Operations.
Credit Hours: 1.5
Format: Class
Prerequisites: 7330 and 7385 or CYS Program Chair approval
Projected Offering: Spring (1st Half)

Department of Government

0901 The History of the United States Coast Guard
(Future Course # - GOV 101)
The History of the U.S. Coast Guard is a one-credit course designed to introduce swabs to the rich history and remarkable achievements of the USCG, while familiarizing students with the historical underpinnings of the CG missions and the Academy. The course will target specific college skills, learning competencies, and communication abilities through information literacy assignments, several short writing projects, and at least one group research project.
Credit Hours: 1.00
Format: Class/Tutorial/Project/Independent Study/Teams/Lecture/Workshop/Online/Off-Site
Prerequisites: None
Projected Offering: SWAB Summer

2163 American Government
(Future Course # - GOV 163)
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 policymaking processes and its consequences.
Credit Hours: 3.00
Format: Lecture/discussion section
Prerequisites: None
Projected Offering: Fall and Spring

2201-Introductory Special Topics in Government
(Future Course # - GOV 201)
Seminars are presented on introductory level themes and topics drawn from any of the various focus areas of the government major, including but not limited to international affairs, regional studies, maritime governance, environmental studies, public policy, law or intelligence. Subject matter, which varies with the instructor, will be announced each semester that the course is offered.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Fall or Spring

2243 Modern Diplomacy
(Future Course # - GOV 243)
The history, art, and practice of modern diplomacy from a State Department perspective, including the role of the Inter-agency process and State-Military cooperation. Key readings examine the development of the U.S. Foreign Service, its culture and organization and the role it has in promoting American values and national interests.
Credit Hours: 3.00
Format: Class
Prerequisites: 2163
Projected Offering: Fall

2265 Comparative Politics
(Future Course # - GOV 265)
This course compares foreign political systems, ideologies and movements. Worldwide trends are explored and selected country studies undertaken.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2163
Projected Offering: Spring

2267 American Congress
(Future Course # - GOV 267)
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 conceptual foundations of Congress and transitions into 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. This course will be offered every other year.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2163
Projected Offering: Spring – Even Years

2269 National Security Policy
(Future Course # - GOV 269)
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: Class
Prerequisites: 2163 or Instructor and Program Chair approval
Projected Offering: Fall

2271 Pop Politics: Exploring American Government through Popular Discourse
(Future Course # - GOV 271)
This course examines the great questions, triumphs, and tragedies of American politics through the medium of popular American discourse. From Hollywood hits to bestsellers to the latest social media hullabaloo, we will discuss the broad themes of American exceptionalism, the role of the US in the world, tension between citizens and communities and their political institutions, and the interactions between political elites and the general public. These themes run throughout the four modules of the course: Foundations, Institutions, Changes, and Conclusions. Each module includes readings and films that provide cadets with new perspectives on key political theories, elected and unelected political actors, and transformative events from various eras.
Credit Hours: 3.00
Format: Class

Prerequisites: None
Projected Offering: Spring

2272 Political Participation
(Future Course # - GOV 272)
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: 2163
Projected Offering: Fall

2281 Intelligence and Democracy
(Future Course # - GOV 281)
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.
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2163 and 2269 (can be concurrent with instructor and Program Chair approval)
Projected Offering: Fall

2282 Intelligence and Cyber Operations
(Future Course # - GOV 282)
This course is specially designed for cadets from all majors, including Government majors who are not in the Security Studies Concentration, who are interested in improving their understanding of national security policy and the national security process, with particular consideration given to the impact of current "cyber" challenges within our multi-discipline, multi-mission Coast Guard, and for the nation more broadly The course reviews the evolution, organization, and responsibilities of the Intelligence Community, the modern national security process, and the role played by the Intelligence Community, homeland security, and law enforcement entities -- as well as other key policy actors and overseers – within it The course will explore how technology has affected intelligence collections, analysis, and dissemination. A special focus of this course will be the CG Cyber Strategy and study of cyber issues within the Coast Guard's operational environment, including: port security, information assurance/ protection, and infrastructure protection. Case studies and examples will be used to illustrate the processes, concepts, and debates regarding intelligence and its role in protecting American security.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2163
Registration Restriction: Secret Security Clearance is required.
Projected Offering: Spring

2293 Moral, Ethical, and Political Philosophy
(Future Course # - GOV 293)
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: None
Projected Offering: Fall and Spring

2301 Special Topics in Government
(Future Course # - GOV 301)
Seminars are presented on intermediate level themes and topics drawn from any of the various focus areas of the government major, including but not limited to international affairs, regional studies, maritime governance, environmental studies, public policy, law or intelligence. Subject matter, which varies with the instructor, will be announced each semester that the course is offered.
Credit Hours: 3.00
Format: Class
Prerequisites: 2163
Projected Offering: Fall or Spring

2338 Politics of Latin America and the Caribbean
(Future Course # - GOV 338)
With the aim of understanding modern politics in the Latin American & the Caribbean (LAC) region, this course first surveys the historical development of political ideas, governing norms, and institutions (Part I). In Part II we then consider the debates among LAC region scholars and subject matter experts as one might encounter in a traditional "Introduction to Latin American Politics" course. In Part III we delve into case studies, using the following regional headings: 1) the Caribbean; 2) Mexico; 3) Central America; and 4) South America. We conclude (Part IV) with an overview of US development and security policies toward the LAC region, with particular emphasis on the roles of USAID, SOUTHCOM and NORTHCOM, the Western Hemisphere Strategy and the unique role of the US Coast Guard.
Credit Hours: 3.00
Format: Class
Prerequisites: 2265 or instructor permission
Projected Offering: Fall

2341 The Civil War Era
(Future Course # - GOV 341)
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
Prerequisites: 2163
Projected Offering: Fall – Odd Years

2355 Public Policymaking
(Future Course # - GOV 355)
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: Class
Prerequisites: 2163
Projected Offering: Fall

2358 Politics of North Africa and the Middle East
(Future Course # - GOV 358)
Following a survey of history and politics that covers the vast geographical region between North Africa (Marrakech) and the Melanesian Crescent (Jakarta), we delve into case studies under the following regional headings: 1) the Maghreb; 2) Egypt and the Sudan; 3) the Levant; and 4) the Arabian peninsula and beyond (including Afghanistan, Pakistan and some of the Asia-Pacific regions that have been influenced by Islamic religion and culture), with an emphasis on the littoral/security

concerns of the region. Upon completion of this course, students are expected to: have a general knowledge of the history of North Africa & the Middle East and appreciate the historical ties and ongoing influences of Islamic religion and culture further east, i.e. through to the Philippines, Indonesia, etc.; be familiar with the terminology used within the subfield of North African & Middle Eastern ("Orientalist") studies; retain an "intellectual framework" for many of the ongoing scholarly debates within the subfield of North African & Middle Eastern studies; and be well prepared for further study within this subfield.
Credit Hours: 3.00
Format: Class
Prerequisites: 2265
Projected Offering: Spring – Even Years

2361 Introduction to Political Theory
(Future Course # - GOV 361)
This course is designed to introduce students to political theory; that is, to learn how to think theoretically about political issues. Students will be taught to examine how worldviews are constructed, how different conceptions of human nature inform political perspectives as well as how to adjudicate the tension between theoretical insights and chaotic lived complexities. Together, we will read both influential theorists (e.g., Sophocles, Machiavelli, Marx, Arendt, Freud, and Fanon) as well as consider contemporary applications of their observations. In order to organize a vast amount of political history and theory, we will focus our understanding on the various ways political theorists have conceived and debated what constitutes political freedom. We will ask not only what it means to be free, but even whether we want to be free. Further, we will examine the obstacles to freedom, as well as what kind of political authority helps to insure freedom. We will pursue these questions, in part, through examinations of Nazi Germany and the trial of Adolf Eichmann, the US civil rights movement, and the economic configurations of freedom under global capitalism. Further, students will be encouraged to consider as secondary themes in the readings: the relationship between vision and knowledge as well as between travel and theory. Finally, students will explore how the various genres of political theory (i.e., theatre, treatise, music, and film) influence the kind of political life imagined and the theoretical possibilities developed.
Credit Hours: 3.00
Format: Class
Prerequisites: 2293 or 2394
Projected Offering: Spring

2362 Homeland Security Policy
(Future Course GOV # - 362)
Across a range of challenges to the United States – immigration and border security, critical infrastructure protection, maritime counterterrorism, disaster preparedness and response – this course integrates the theory and practice of homeland security. Recognizing the unique and evolving environment that future Coast Guard officers will face, heavy emphasis is given to the policy, strategic, operational, and tactical dimensions of securing the homeland. Beyond the statutory missions of the Coast Guard, careful study is given to key actors, institutions, and processes – federal, state, local, private, and international – that comprise the homeland security policy space. Through an emphasis on policy analysis and critical thinking, the course explores the challenges and opportunities posed by homeland security and examines how our government is evolving to adapt to them. This course will be offered every other year.
Credit Hours: 3.00
Format: Class
Prerequisites: 2163 and 2355 (or concurrent)
Projected Offering: Spring – Even Years

2363 Contemporary Political Theory
(Future Course # - GOV 363)
Political theory brings together two seemingly incompatible realms– the messy, contingent world of human beings living in community and the interpretations, understanding and meanings human beings construct for how to do so productively, happily and with minimal conflict. This course is an exploration of some of the contemporary configurations of that juxtaposition in a post 9/11 world. The course will focus this semester on contemporary (and historical) understandings of revolution and the transition to democracy. We will consider, also, how we live with the pluralism in our American midst and what, if any, are our responsibilities to those who are far away. Finally, we will explore the ethos and possibilities of

reconciliation and the role of national apologies post 9/11.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2163
Projected Offering: Fall

2364 Building Healthy Communities
(Future Course # - GOV 364)
Using some of the elements from The Science of Well-Being – currently one of the most popular courses on several college campuses – this course will consider some studies from the "science of happiness" – for example, what makes us happy? Why are we so often wrong about what will make us happy? And what are some of the evidence-based practices that improve happiness (and thus professional success and military retention)? The course will also examine some historical and contemporary political philosophies about the complicated juxtaposition of healthy, flourishing relationships and demanding and challenging societal expectations. For this, we will read, among others, Sigmund Freud's Civilization and its Discontents as well as the Noble Prize-winning work by Richard Thaler and Cass Sunstein, about whether the government should "nudge" us to make good choices. The last section of the course, and perhaps the most challenging, will examine why so little progress has been made in recent decades regarding sexual assault, harassment, and bullying on our college campus, as well as at other colleges. This part of the class will be a candid but theoretically rigorous attempt to consider how to create a community at USCGA that continues to align with our core values of Honor, Respect, and Devotion to Duty.
Credit Hours: 3.00
Format: Seminar
Prerequisites: None
Restriction: 2/c and 1/c only
Projected Offering: Fall and Spring

2367 International Relations
(Future Course # - GOV 367)
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 nongovernmental, regional, and international organizations on each other and the overall global community are compared and discussed.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2265
Projected Offering: Fall

2369 Contemporary United States Foreign Policy
(Future Course # - GOV 369)
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: 2265 or can be concurrent with instructor and Program Chair approval
Projected Offering: Spring

2370 American Presidency
(Future Course # - GOV 370)
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. This course will be offered every other year.
Credit Hours: 3.00

Format: Seminar
Prerequisites: 2163
Projected Offering: Spring – Odd

2371 Area Studies
(Future Course # - GOV 371)
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: 2163 and 2265
Projected Offering: Fall or Spring

2375 Strategic Intelligence: Collection and Analysis
(Future Course # - GOV 375)
The global environment of the past decade raises new questions about American security and America's vulnerability to global threats. It also focused new attention on the U.S. Intelligence Community (IC): its interactions with policymakers. how it is organized, how it works, and the products it generates in support of homeland and national security decision and policy makers. This course is designed to explore the "how it works" aspect of the IC, the "business" of intelligence, most notably the intelligence process with specific emphasis on collection systems (both human and technical) and the critical thinking, analysis, writing and dissemination of finished intelligence analysis specifically in the areas of transnational asymmetric threats. Finally, it provides a look at how intelligence analysis supports policymakers in a democratic society. A special focus of the course is Coast Guard Intelligence, its binary role as both a law enforcement agency and a member of the U.S. Intelligence Community, and its roles related to homeland and national security.
Credit Hours: 3.00
Format: Class
Prerequisites: 2269 and 2281
Projected Offering: Fall

2377 Politics of China
(Future Course # - GOV 377)
The course is designed to provide a background for one’s understanding of modern Chinese politics with an emphasis on the mainland in the post-Mao reform era while examining major challenges confronting China today. Key topics include modern political history, political culture and ideology, political institutions, political processes, the Chinese Communist Party, the role of the military, foreign affairs, economic development, and special regions such as Hong Kong, Taiwan, and Tibet. By the end of the semester, students should be able to gain a better understanding of the current developments in Chinese politics.
Credit Hours: 3.00
Format: Class
Prerequisites: 2367 or concurrent with instructor approval
Projected Offering: Fall – Odd Years

2378 Politics of Asia
(Future Course # - GOV 378)
This course is a general survey of the politics of Asia, with an emphasis on contemporary Pacific Asia. Starting with the general environment of Asia, this course covers the history, politics, and international relations of major Asian powers and discusses the main economic and security issues that concern Asian countries today. Upon completion of the course, students are expected; 1) to be familiarized with the international and domestic politics of Asia; 2) to gain a better understanding of the historical and current developments of Asian countries; and 3) to apply international relations concepts and theories to the study of Asia.
Credit Hours: 3.00
Format: Class
Prerequisites: 2367 or concurrent with instructor and Program Chair approval

Projected Offering: Fall

2379 Study of the Koran
(Future Course # - GOV 379)
In this 1-credit course, students will read the entire Koran, in addition to an easy secondary source which helps to explain the Koran. Topics discussed will include differences in translations, views regarding the nature of the Koran, the importance of revelation order, different interpretations, and interpretive strategies (including the debate over abrogation) and the relation of the Koran to other sacred scriptures. There are no prerequisites for this course, which does not presuppose any background in Islam. This course is normally taken by non-Government majors; Government majors may take it only with instructor permission.
Note: Cadets may take either 2373 or 2379, but may not take both.
Credit Hours: 1.00
Format: Seminar
Prerequisites: None
Projected Offering: Spring – Even Years

2380 Introduction to Psychology
(Future Course # - GOV 380)
This course is a survey of the major theories and practices in the field of Psychology. Topics include biological psychology including sensation, learning, thinking and memory, emotions, personality, stress, and social psychology. Additional topics such as lifespan development, clinical psychology and psychological disorders may be included based on cadet interest and instructor expertise.
Credit Hours: 3.00
Format: Lecture
Prerequisites: None
Projected Offering: Fall

2382 Politics of the Ocean
(Future Course # - GOV 382)
This course explores how the ocean is, and has long been, a deeply politicized space. Cadets are introduced to some of the domestic and international politics and policy debates related to ocean resources and uses. Ocean policy and politics are investigated through in-depth investigations of ocean governance institutions and arrangements; fisheries and marine conservation; crime, pollution, whaling, and piracy at sea; and emerging ocean policy issues: high seas conservation, offshore aquaculture, deep sea mining, and territorial disputes. This course draws upon cadets' foundational knowledge from required courses including Public Policymaking and International Relations. It uses this foundation to explore the processes by which ocean policy is made, the governmental and non-governmental institutions and actors that shape ocean policy and politics, and the unique governance arrangements developed to manage ocean resources and uses. Through this course we will consider four recurring themes: (1) the ocean as the ultimate "great commons"; (2) the unique and complex nature of ocean resources and activities as policy domains; (3) the ways in which intergovernmental institutions, non-governmental stakeholders and private industry shape ocean politics; and (4) the extent to which these unique challenges promote both conflict and cooperation at sea.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 2355 and 2367
Registration Restrictions: 2/c and 1/c only
Projected Offering: Spring Even Years

2392 Maritime Studies: Selected Topics
(Future Course # - GOV 392)
1/c seminar on maritime cultures, history, economics, politics, law, governance, geopolitics, transportation, safety, or security topics that vary each semester and span different disciplinary perspectives. Topics are determined annually. Seminar requires exploration of the maritime domain through readings, seminar discussions, and research and writing requirements.
Credit Hours: 3.00

Format: Seminar
Prerequisites: 2163
Projected Offering: Fall and Spring

2395 Rhetoric and Courtroom Advocacy
(Future Course # - GOV 395)

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
Format: Seminar
Prerequisites: None
Projected Offering: Fall and Spring

2397 Constitutional Law and Homeland Security
(Future Course # - GOV 397)

A study of the principal provisions of the U.S. Constitution and the methods by which American government officials, including judges, legislators, and Presidents, give meaning to those provisions. The course will specifically emphasize civil liberty concepts and the function of the Constitution in the realm of Homeland Security.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2361 and 2355 (or concurrent)
Projected Offering: Spring

2398 Principles of Criminal Justice and Maritime Operational Law
(Future Course # - GOV 398)

This course will introduce students to the U.S. domestic legal system and educate them in criminal justice and operational law concepts essential for Coast Guard officers. It will first cover fundamental legal principles and nomenclature, as well as how law is created and implemented in the U.S. The course will then address broad criminal law concepts and how these principles apply within the Uniform Code of Military Justice and the traditions of military service. The second half of the course will build on the first but focus on maritime law enforcement and Coast Guard operational law, including international law concepts, the Law of the Sea and maritime jurisdiction, use of force, and the legal authorities and issues related to several key Coast Guard mission areas.
Credit Hours: 4.00
Format: Class
Prerequisites: None
Projected Offering: Fall and Spring

2401 Advanced Special Topics in Government
(Future Course # - GOV 401)

Seminars are presented on advanced themes and topics drawn from any of the various focus areas of the government major including, but not limited to, international affairs, regional studies, maritime governance, environmental studies, public policy, law or intelligence. Subject matter, which varies with the instructor, will be announced each semester that the course is offered.
Credit Hours: 3.00
Format: Class
Prerequisites: 2163
Projected Offering: Fall or Spring

2463 Maritime Governance
(Future Course # - GOV 463)
Focuses on national and international policy processes, institutions, and dimensions that comprise maritime policy systems at the national and international levels. Influences and constraints that affect policy formulation and implementation are investigated, including how human values, institutions, cultures, and history shape maritime issues and policy responses. Theoretical and methodological frameworks in public policy. such as the tragedy of the commons and public choice theory, are used to assess the efficiency, effectiveness, and efficacy of U.S. and international maritime policies and policy systems at the beginning of the 21st century. Topics include developments in ocean and waterways use since mid-century and contemporary challenges in maritime governance, safety, and security.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2355
Registration Restrictions: 1/c only
Projected Offering: Fall

2465 United States Military Policy
(Future Course # - GOV 465)
Examine American military strategy from the colonial period to the present. Course background originates with definitions of key ideas and terms, and the historical antecedents and influences of the colonial era. The course then moves into a chronological discussion of the major events, periods, and influences pertaining to American military affairs. We cover policy and strategy; we will see a bit on operations, but no tactics. Course themes include the relationship between American culture and war making; the links between national policy, foreign policy, military policy, and military strategy; and the issue of civil-military relations, including not only civilian control of the military, but also the influence of American society upon the military as an institution. This course hopes to explain - and question-the nature and motives of American war making, the roles of a variety of players in policy making (public, private, civilian, and military), and the connections between society's values/goals and the use of the military.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2163, 2355
Registration Restriction: 1/c Government Majors or Instructor Approval for non-Government Majors
Projected Offering: Spring – Even Years

2467 Environmental Policy
(Future Course # - GOV 467)
Examines U.S. environmental policies, with particular focus on policies regarding biodiversity, pollution control, waste disposal, and Coast Guard missions in the maritime environment. We will explore various policymaking frameworks, such as administrative rationalism and economic rationalism, as well as issues of human rights, ecology, biocentrism, and bioregionalism. We will study a variety of approaches to evaluating environmental policies, including market-based policies (such as “cap-and-trade”) and intersections with federal law.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2355
Registration Restriction: 1/c only
Projected Offering: Spring

2468 Religion, Politics and Globalization
(Future Course # - GOV 468)
This course is an examination of the complex matrix of globalization, religion, and contemporary political issues. To begin to understand this terrain, we will read theories of globalization exploring the movement of people, ideas, and capital as well as various theories of the relation between religion and violence as well as between religion and reconciliation. Specifically, we will examine the ways in which the forces of globalization have created both more religious tolerance as well as in some instances more religious conflict.
Credit Hours: 3.00
Format: Seminar

Prerequisites: 2361
Registration Restriction: 1/c only
Projected Offering: Fall

2472 Transnational Threats
(Future Course # - GOV 472)
This course educates Coast Guard Officers of the 21st Century by providing an overview of transnational security, challenges and their effects on the political, economic and security elements of society. For the purposes of this course, threats are construed as those issues which promote instability and for which current policy, management and leadership paradigms struggle to successfully coordinate action and mitigate effects. The course examines an array of threats including criminal enterprises that traffic in people, weapons, and drugs as well as non-criminal challenges including public health threats and environmental and energy security. The course closely examines the legal, political, policy and law enforcement responses employed at the national and international level to mitigate transnational threats within the context of globalization.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2163, 2367, or permission of Instructor and Program Chair
Registration Restriction: 1/c only
Projected Offering: Spring

2482 Cyber Crisis and Conflict
(Future Course # - GOV 482)
This course is designed for 1/c cadets from all majors interested in deepening their studies in national security, intelligence, and cyber policy. Cadets will prepare for and take part in national and international cyber challenges that will enable them to think critically, respond to, and manage high-tempo cybersecurity crises and conflicts. Extensive out of class preparation is required and cadets must participate in all scheduled off-site competitions.
Credit Hours: 1.00
Format: Seminar
Prerequisites/Corequisites: 2269, 2281, or 2282
Projected Offering: Spring

2485 Global Challenges
(Future Course # - GOV 485)
This course will 1) help developed a clear understanding of the differences among individual, national, state, international, and global goals; 2) enhance global awareness; 3) help cadets participate in world affairs as a critical and informed citizen; 4) ensure cadets critically assess their own perspectives and recognize how different social and historical circumstances may impact one's own viewpoint in the world and 5) better understand the relevance of global affairs to the missions of the U.S. Coast Guard/Department of Homeland Security and to the maritime domain in which they will operate.
Credit Hours: 3.00
Format: Class/Lecture
Prerequisites: 2163
Projected Offering: Fall and Spring

2494 International Law
(Future Course # - GOV 494)
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 the actions of state and non-state actors. The course will also take an in-depth look at sovereignty and the law of armed conflict.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2163 and 2398
Registration Restriction: 1/c only
Projected Offering: Fall

2495 Advanced Studies in Government
(Future Course # - GOV 495)
Advanced Studies in Government allows students to undertake original scholarship and research on political systems and governmental institutions, programs, and policies both domestically and internationally. Two alternatives comprise this senior level study. First, cadets may be selected for an externally sponsored and nationally recognized scholars program such as the Center for the Study of the Presidency or Joint Service conference scholars program. The second option is for cadets to compete for an internship with Connecticut State government. Past placements for Connecticut internships have included the Office of the Attorney General and the Governor's Office. This course requires the production of an original research paper or participation in the internship. This course will count as the cadet's Capstone Requirement.
Credit Hours: 3.00
Format: Class/Project/Seminar
Prerequisites: Placement through Academic Excellence Opportunity application only
Registration Restriction: 1/c only
Projected Offering: Fall or Spring (Fall preferred)

2497 Senior Thesis in Government
(Future Course # - GOV 497)
The Senior Thesis facilitates specialization within the Major Concentration through an independent research project under the supervision of a two-person faculty committee, at least one of whom must be a member of the permanent faculty with terminal degree. The Senior thesis results in a substantial written product and an oral defense of the thesis. This course will count as the cadet's Capstone requirement.
Credit Hours: 3.00
Format: Class/Project/Seminar
Prerequisites: Placement through Academic Excellence Opportunity application only
Registration Restriction: 1/c only
Projected Offering: Fall or Spring (Fall preferred)

2499 Advanced Research Projects
(Future Course # - GOV 499)
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: Placement through Academic Excellence Opportunity application
Registration Restriction: 1/c only
Projected Offering: Fall and Spring

Department of Health and Physical Education

4101 Developmental Swimming
(Future Course # - HPE 101)
Developmental Swimming is designed to provide cadets who have been identified as weak swimmers with supplemental instruction in swimming.
Credit hours: 0.00
Format: Laboratory
Prerequisites: None
Projected Offering: Fall

4111 Swimming
(Future Course # - HPE 111)
Swimming 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: 0.50
Format: Laboratory/8-Week
Prerequisites: None
Projected Offering: Fall and Spring

4115 Personal Movement & Development
(Future Course # - HPE 115)
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:
Projected Offering: Fall or Spring

4204 Lifetime Sports I: Badminton
(Future Course # - HPE 204)
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: 0.50
Format: Laboratory/8-Week
Prerequisites: None
Projected Offering: Fall and Spring

4214 Lifetime Sports II: Golf
(Future Course # - HPE 214)
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: 0.50
Format: Laboratory/8-Week
Prerequisites: None
Projected Offering: Fall and Spring

4215 Lifetime Sports II: Pickleball
(Future Course # - HPE 215)
This course provides instruction in the fundamentals of pickleball. Cadets will receive instruction in technique, rules, and tactical play for both singles and doubles play.
Credit Hours: 0.50
Format: Laboratory/8-Week
Prerequisites: None
Projected Offering: Fall and Spring

4222 Professional Rescuer
(Future Course # - HPE 222)
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
(Future Course # - HPE 303)
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: 0.50
Format: Laboratory/8-Week
Prerequisites: 4115
Projected Offering: Fall and Spring

4304 Lifetime Sports III: Tennis
(Future Course # - HPE 304)
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.
Credit Hours: 0.50
Format: Laboratory/8-Week
Prerequisites: None
Projected Offering: Fall and Spring

4400 Remedial Physical Training
(Future Course # - HPE 400)
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: None
Projected Offering: Fall and Spring

4405 Adventure Sports I: Rock Climbing
(Future Course # - HPE 405)
This course provides instruction in basic belaying, rappelling, and climbing techniques. Climbing safety is a major focus. Fee required.
Credit Hours: 0.50
Format: Laboratory
Prerequisites: None
Projected Offering: Fall

4407 Dance
(Future Course # - HPE 407)
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: None
Projected Offering: Fall and Spring

4411 Scuba Diving
(Future Course # - HPE 411)
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: 1.00
Format: Laboratory/16 weeks

Prerequisites: 4111 and 4222
Projected Offering: Fall and Spring

4414 Lifetime Sports: Advanced Golf
(Future Course # - HPE 414)
This course provides advanced instruction in golf and offers cadets the opportunity to play on local courses. This course is conducted at local golf course. Cost dependent on green fees and cadets enrolled in the course are responsible for these expenses.
Credit Hours: 0.50
Format: Laboratory/8 weeks
Prerequisites: 4214
Projected Offering: Fall and Spring

4439 Theory of Coaching
(Future Course # - HPE 439)
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: None
Projected Offering: Fall and Spring

4444 Indoor Recreational Sports
(Future Course # - HPE 444)
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: None
Projected Offering: Fall and Spring

4459 Sport/Wellness Leader
(Future Course # - HPE 459)
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: None
Projected Offering: Fall and Spring

4464 Strength and Conditioning
(Future Course # - HPE 464)
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

4470 Yoga
(Future Course # - HPE 470)
This course is designed to introduce cadets to a multi-dimensional exercise system and lifetime skill set which cultivates the ability to function more efficiently in high-demand, high-stress Coast Guard environments. Cadets will learn to enhance the

mind-body connection through stretching, balancing, and strengthening of the body, while calming, centering, and focusing the mind. Additional benefits include increased confidence, stress management, and improved physical and mental wellness and resiliency. Cadets will learn basic Yoga principles and positions, and breathing techniques, to help manage stress, improve focus and alertness, and reach a state of healthy relaxation. Cadets will be introduced to challenging positions to use for goal setting and personal progress benchmarks, and will be required to develop a personal wellness regimen that can be applied throughout their career, anytime and anywhere, with no required equipment. Additionally, cadets will incorporate teamwork through partner-based practice relying on verbal and visual cues to guide partners through self-developed yoga sequences.
Credit Hours: 0.50
Format: Class/Laboratory/16 weeks
Prerequisites: None
Projected Offering: Spring

4471 Bowling
(Future Course # - HPE 471)
Bowling is an introductory level course designed to foster the development of fundamental skills in bowling and to support cadet commitment to lifelong participation in physical activity. Fundamentals including stance, approach, arm swing and release will be covered in class. In addition to that, scoring, spot targeting for strikes and spares as well as bowling etiquette and terminology will be reviewed. Participants will receive practical experience through league play and team tournaments.
Credit Hours: 0.50
Format: Class/Laboratory/16 weeks
Prerequisites: None
Projected Offering: Spring

4489 Selected Topics in Health and Physical Education
(Future Course # - HPE 489)
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:
Registration Restriction: Permission of the Department Head
Projected Offering: Fall and Spring

Department of Management

8115 Macroeconomic Principles
(Future Course # - MGT 115)
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: Lecture
Prerequisites: None
Projected Offering: Fall and Spring

8142 Tools for Business Intelligence
(Future Course # - MGT 142)
In today's fast-paced, technology-driven business environment, digital literacy is an essential skill for all management professionals. Tools for Business Intelligence is designed to equip students with foundational computer knowledge, digital skills, and practical expertise required to excel in both their academic careers and future occupations as Coast Guard Officers. This course offers a comprehensive introduction to essential software applications in the Microsoft Suite, including Word, Excel, PowerPoint, and Outlook, as well as an overview of basic computer concepts, digital communication, and collaboration tools. Throughout this course, students will engage in hands-on exercises and real-world scenarios to develop

proficiency in creating professional documents, spreadsheets, and presentations. They will also learn to efficiently manage email and calendar systems, as well as explore other emerging technologies that enhance productivity and support effective decision-making. Emphasizing practical application, this course ensures that Management majors are well-equipped to navigate and excel in the modern digital workspace.
Credit Hours: 3.00
Format: Lecture
Prerequisites: None
Projected Offering: Spring (Fall as required)

8201 Introduction to Management and Business
(Future Course # - MGT 201)
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: Lecture
Prerequisites: None
Registration Restriction: Management majors only
Projected Offering: Fall and Spring (Spring is only for late entrants into major)

8211 Organizational Behavior and Leadership
(Future Course # - MGT 211)
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: Lecture
Prerequisites: None
Projected Offering: Fall, Spring and Summer

8217 Microeconomic Principles
(Future Course # - MGT 217)
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: Lecture
Prerequisites: None
Projected Offering: Fall

8241 Legal Environment of Business
(Future Course # - MGT 241)
This course introduces you to the fundamental principles of business law and will address legal issues that impact managerial decision making in the public, private and non-profit sectors. You will explore the interplay of those legal principles with operations, government regulations, and the ethical and social responsibilities inherent in business decision-making. Topics include: sources of law, business ethics, commercial transactions, torts, intellectual property, business entities, employment law and environmental law.
Credit Hours: 3.00
Format: Lecture
Prerequisites: None
Projected Offering: Spring

8246 Principles of Financial Accounting
(Future Course # - MGT 246)
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
Format: Lecture
Prerequisites: None
Projected Offering: Spring

8313 Essentials of Economics for Engineering Majors
(Future Course # - MGT 313)
This course is an accelerated introduction in Microeconomics and Macroeconomics. It covers the essentials of material otherwise taught in less than a single semester. The section on Microeconomics focuses on studying the behavior of individual economic agents, including consumers and firms, in a market system. This includes learning about supply and demand, taxes, government influences on markets, externalities, and production and cost, along with a summary of output and pricing decisions in different market settings like perfect competition and monopoly. The section on Macroeconomics focuses on an analysis of the behavior of the national economy as a whole, together with such issues as the determination of gross domestic product, the unemployment rate, the inflation rate, interest rates, and the long-term economic growth rate. This is a fast-paced course designed for students whose preparation in the requisite quantitative skills is above average. At the end of the semester, students will have a solid understanding of modern microeconomics, markets, and the macro-economy.
Credit Hours: 2.00
Format: Lecture
Prerequisites:
Registration Restriction: Engineering Majors
Projected Offering: Fall and Spring

8331 Management Information Systems
(Future Course # - MGT 331)
Prepares managers to function in a technological environment. The role 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 research project on current technology topics is required.
Credit Hours: 3.00
Format: Lecture
Prerequisites: None
Projected Offering: Fall

8342 Marketing
(Future Course # - MGT 342)
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: Lecture
Prerequisites: None
Projected Offering: Spring

8348 Managerial Accounting
(Future Course # - MGT 348)
Students will be introduced to the wide variety of management models, basic costing models, and analytical approaches used by organizations. Emphasis will be placed on behavior of cost, tactical decision-making models, product costing, budgeting, control systems, and performance measurement. Analytical problem solving, both structured and unstructured, is required and will involve the application of fundamental financial accounting methods and knowledge.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8246
Projected Offering: Fall

8349 Financial Management
(Future Course # - MGT 349)
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: Lecture
Prerequisites: 3213, 8246 or permission of the instructor
Projected Offering: Spring

8351 Research Methods
(Future Course # - MGT 351)
Examination of quantitative analysis techniques and concepts that builds upon the numeracy, measurement, and proportional reasoning learned in Computer-Based Problem Solving, and upon the descriptive statistics and basic probability theory learned in Probability and Statistics. Qualitative analysis techniques and concepts including survey methods are introduced. Students learn how to conceptualize an object and an attribute of it so that the attribute has a unit of measure, to interpret models to discover trends and make predictions, and to create representations to explain a phenomenon and revise them based on fit to reality. Case studies and a research project.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 2142, 3213
Projected Offering: Fall

8357 Human Resources Management
(Future Course # - MGT 357)
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: Lecture
Prerequisites: 8211
Projected Offering: Fall

8363 Operations Management
(Future Course # - MGT 363)
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: Lecture
Prerequisites: 3213 or equivalent course
Projected Offering: Spring

8366 Leadership, Organizational Development and Change
(Future Course # - MGT 366)
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: Lecture
Prerequisites: 8211
Projected Offering: Spring

8415 Personal Finance
(Future Course # - MGT 415)
A study of issues relevant to personal finance. Topics include budgets, insurance, taxes, markets, investments, retirement, and estate planning.
Credit Hours: 1.00
Format: Lecture
Prerequisites: None
Projected Offering: Fall and Spring

8417 Investment Theory
(Future Course # - MGT 417)
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: Lecture
Prerequisites: 3213, 8217, 8349 or equivalent courses, or permission of the instructor
Projected Offering: Spring

8418 Fundamentals of Personal Financial Planning
(Future Course # - MGT 418)
This course seeks to develop a level of financial literacy necessary to avoid financial mistakes that can derail a career. Financial planning seeks to develop a level of financial literacy necessary to manage all aspects of an individual's financial affairs, both immediate and long-term needs. Topics covered include career selection, budgeting, taxes, retirement planning, the use and management of credit, the management of risk (through the use of insurance and non-insurance means), and estate planning. Special attention is given to large purchases, such as automobiles and real estate.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8349 or concurrent with instructor approval
Projected Offering: On Demand

8419 Information Technology in Organizations
(Future Course # - MGT 419)
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: Lecture

Prerequisites: 8331 or 7218 or Instructor permission
Projected Offering: Spring

8429 Managerial Psychology
(Future Course # - MGT 429)
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: Lecture
Prerequisites: 8211
Projected Offering: Fall

8440 Federal Budgeting
(Future Course # - MGT 440)
This course covers selected topics in federal budgeting. Since this is a broad subject, our focus is on governmental accounting and budgeting standards. Students are exposed to the basics of how the federal budget is formulated, resolved, and executed at the national level, in the Coast Guard, and at the Coast Guard field level. Government accounting methods, government accounting standards, economic and agency-specific policy are central to understanding budget analysis and formulation. Students will begin the semester learning about the process of how the federal budget is passed and identification of specific budget laws that define how we formulate and pass our nation's budget. Students will also be required to demonstrate an understanding of breakeven analysis, applying different costing models, and revenue forecasting models, as it pertains to federal budgeting. Near the end of the course, students are also exposed to the basics of appropriations law and procurement policies specific to the Coast Guard. Last, students will have an opportunity to prepare and pursue testing for parts of the Certified Government Financial Manager (CGFM) exams, which is backed by the Association of Government Accountants.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8246 and 8348
Projected Offering: Spring

8443 Strategic Management
(Future Course # - MGT 443)
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: Lecture
Prerequisites: 8115, 8217, 8246, 8349, and 8366
Registration Restriction: 1/c Management majors
Projected Offering: Fall

8444 Public Management Consulting Preparation
(Future Course # - MGT 444)
The course is designed to add to and focus student skills needed to excel in the Public Management Consulting (PMC) capstone course of the Management degree program. Students learn professional consulting skills, how to apply the DMAIC framework, and effective, ethical and legal ways to use information to accomplish a specific purpose. Students demonstrate the ability to integrate current research into a literature review, to apply relevant data analysis methodologies, competent presentation skills, and competent project management skills. Deliverables include a letter of engagement, a literature review, and a work plan for completing a PMC capstone project in the spring semester.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8115, 8217, 8246, 8349, and 8366

Registration Restriction: 1/c Management majors
Projected Offering: Fall

8445 Public Management Consulting
(Future Course # - MGT 445)
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: Lecture
Prerequisites: 8357, 8443, 8444
Registration Restrictions: 1/c Management majors
Projected Offering: Spring

8446 Intermediate Financial Accounting
(Future Course # - MGT 446)
This course is a continuation of 8246, Principles of Financial Accounting. This course will delve more deeply into the technical aspects of accounting, stressing the role played by International Standards on US GAAP, as well as greater depth in the treatment of complex accounting issues, such as revenue recognition, stock and stock options, pensions, and related advanced topics. The focus will be on how various accounting policy choices affect the formal financial statements and how assumptions can radically change these reported outcomes.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8246
Projected Offering: Fall

8447 Auditing and Internal Control
(Future Course # - MGT 447)
This course is the capstone offering in the Financial Management concentration, placing its emphasis on the auditing activity and how internal controls can be used to reduce the operational risk of an organization. Students will increase their analytical skills in addition to gaining a more realistic understanding of the role of internal control in curbing undesirable or dysfunctional behavior in organizations and to safeguard the assets of the organization. The course will convey existing U.S. Audit Standards (GAS) as well as established audit and control procedures as detailed in the COSO Framework and the Sarbanes-Oxley (SOX) Acts.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8246 and 8348
Projected Offering: Spring

8449 Selected Topics in Information Systems and Decision Sciences
(Future Course # - MGT 449)
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.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Registration Restrictions: 1/c cadets
Projected Offering: On demand

8450 Selected Topics in Management and Leadership
(Future Course # - MGT 450)
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: Lecture
Prerequisites: 8366
Registration Restrictions: 1/c cadets
Projected Offering: On demand

8451 International Business Operations
(Future Course # - MGT 451)
A survey of major aspects of international business environment and operations with an emphasis on the cultural dimension. International business is important and necessary because economic isolation has become impossible. Failure to become a part of the global market assures a nation of declining economic influence and deteriorating standards of living for its citizens. International business therefore presents more opportunities for expansion, growth, and income than does domestic business alone. This course will cover the major aspects of international business environment and operations with an emphasis on its impact on the local organizations. In this course you will learn why international business differs from domestic business and develop a basic understanding of international economics, monetary systems, trade, and investment trends. You will have the opportunity to develop your own view on international business and global strategy.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8349
Registration Restrictions: 1/c Management Majors
Projected Offering: Fall

8452 Contemporary Skills for Business Professionals
(Future Course # - MGT 452)
Emphasizes the development of individual, group, critical thinking, and presentation skills, through the application of modern method and business technology. This course is designed to provide fundamental skills necessary for success in the business environment. This major area elective emphasizes the following: (I) An introduction to student-centered learning, especially with opportunities for active and collaborative learning utilizing state of the art elements of technological business environment. (2) An introduction to inquiry-based processes necessary for understanding and addressing issues and opportunities in current and emerging business environments. (3) Development of excellent persuasion skills, relevant to individual and group effectiveness. (4) Team building and participation while completing projects that focus on respecting the views of others. (5) Development of an understanding of and competence in the multiple roles that define successful teamwork. (6) Application of the hardware and software skills necessary for transferring knowledge of business topics in both face-to-face and virtual settings.
Credit Hours: 3.00
Format: Lecture
Prerequisites: None
Registration Restrictions: 1/c Management Majors
Projected Offering: Spring

8453 Systems Analysis and Design
(Future Course # - MGT 453)
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: Lecture
Prerequisites: 8331 or 7218 or equivalent, or permission from the instructor
Projected Offering: Fall

8458 Negotiations and Conflict Management
(Future Course # - MGT 458)
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. 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: Lecture
Prerequisites: 8211
Projected Offering: On demand

8460 Cost Accounting
(Future Course # - MGT 460)
This course provides a comprehensive study of the field of cost accounting, one of the critical accounting skill sets required for all practicing financial managers. Topics covered briefly in Managerial Accounting will be expanded upon, while additional advanced topics, such as joint cost allocation, will be introduced. Students will increase their analytical skills and ability to work with complex cost problems including the development of budgets and capital budgeting procedures. Topics will be explored from several perspectives: for-profit versus governmental standards, integration with financial accounting, and international vs. US standards and practices. Successful completion of Financial Accounting (8246) and Managerial Accounting (8348) are required for admittance to this course.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8246 and 8348 or permission of Instructor
Projected Offering: Fall

8461 Supply Chain Management
(Future Course # - MGT 461)
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: Lecture
Prerequisites: 3213 or equivalent course
Projected Offering: On demand

8462 Certified Government Financial Manager Part I
(Future Course # - MGT 462)
This class prepares you for the Exam 1: Certified Governmental Financial Management (CGFM) exam. The CGFM is a professional certification based on accounting fundamentals and policies in the public sector. This one-credit course is offered by the Association of Government Accountants (AGA). A CGFM certification is recognized nationwide and is advocated by the Department of Homeland Security and the Coast Guard's Office of the Assistant Commandant for Resources, Chief Financial Officer (CG-8). Last, this class provides you the opportunity and experience to earn a professional credential and to experience earning a credential via standardized and official testing centers.
Credit Hours: 1.00
Format: Lecture
Prerequisites: 8246, 8348

Projected Offering: Fall

8463 Certified Government Financial Manager Part II
(Future Course # - MGT 463)

This class prepares you for the Exam 2 and 3: Certified Governmental Financial Management (CGFM) exam. Exam 2 is complemented by Federal Budgeting (8440). Exam 3 is complemented by Auditing and Internal Control (8447). The CGFM is a professional certification based on accounting fundamentals and policies in the public sector. This one-credit course is offered by the Association of Government Accountants (AGA). A CGFM certification is recognized nationwide and is advocated by the Department of Homeland Security and the Coast Guard's Office of the Assistant Commandant for Resources, Chief Financial Officer (CG-8). Last, this class provides you the opportunity and experience to earn a professional credential and to experience earning a credential via standardized and official testing centers.
Credit Hours: 1.00
Format: Class/Seminar
Prerequisites: 8246, 8348
Projected Offering: Spring

8464 Business Analytics
(Future Course # - MGT 464)

This course teaches students to process and use data for management decision-making. Topics covered include descriptive analytics using visualization, predictive analytics using regression and clustering methods, and prescriptive analytics using optimization methods. Exercises and project(s) focus on applications of analytical tools for real-world business and management scenarios.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 8351
Projected Offering: Spring

8468 Directed Studies in Finance, Accounting, and Economics
(Future Course # - MGT 468)

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 Program Chair, and sponsoring faculty member prior to the beginning of the semester.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 8217, 8348, 8349, or equivalent courses
Registration Restrictions: 1/c Management majors and approval of the Program Chair
Projected Offering: On demand

8469 Directed Studies in Management and Leadership
(Future Course # - MGT 469)

An in-depth, major research effort in an area of mutual interest to cadet and faculty member directing study. Potential topics include, but are not limited to leadership, consumer behavior, real estate phenomenon, nature of military organizations, etc. Directed Studies proposal must be submitted in writing and approved by the Program Chair and sponsoring faculty member prior to the beginning of the semester.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 8366
Registration Restriction: 1/c Management majors and approval of the Program Chair
Projected Offering: On demand

8470 Directed Studies in Information Systems and Decision Sciences
(Future Course # - MGT 470)

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. Directed Studies proposal must be submitted in writing and approved by the Program Chair, and sponsoring faculty member prior to the beginning of the semester.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 8331, 8363 or equivalent courses
Registration Restriction: 1/c Management majors and approval of the Program Chair
Projected Offering: On demand

Department of Marine Science

5216 Oceanography
(Future Course # - MS 216)
Oceanography is a foundational science course that focuses on the importance of the ocean and the complex issues related to changes in the ocean environment. This course explores the fundamental processes governing the geology, circulation, chemistry, and biology of the world's oceans and the relationship between humans and the ocean. Topics include biological productivity and fisheries, marine pollution, and ocean energy. Laboratories provide hands-on exercises, analysis of published data, and field observations that explore oceanographic concepts. Oceanography provides a third option for the lab science requirement.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5102 and 5162
Projected Offering: Spring

5232 Marine Biology
(Future Course # - MS 232)
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:
Registration Restriction: MES Majors or Instructor approval for non-majors.
Projected Offering: Fall

5236 Oceans I: Air and Sea
(Future Course # - MS 236)
Oceans I: Air & Sea is a 4-credit entry level course in the Marine and Environmental Science Major. The course provides a fundamental background in descriptive and dynamical atmospheric and ocean circulation. The course begins with a discussion of fundamental concepts including composition, structure and radiative balances of the atmosphere and ocean. General ocean and atmosphere circulation is described and explained in terms of the forces responsible for fluid motion. The equations of motion for a fluid on a rotating earth are introduced and geostrophic and ageostrophic (Ekman) flows are investigated. Laboratory work expands on concepts presented in lecture and emphasizes data collection, analysis, and real-world applications.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: None
Corequisites: 5162
Projected Offering: Fall

5241 Oceans II: Land and Sea
(Future Course # - MS 241)

Oceans II: Land & Sea is a 3.5-credit course in the Marine and Environmental Science Major. The course is designed to be a follow-on to Oceans I: Air & Sea, and in conjunction with the previous course provides the foundations for understanding the marine environment. The goal of the course is to provide the student with a basic background in geochemical processes, as well as physical oceanographic processes that impact the geological, chemical, nutrient distributions in the ocean. An emphasis is placed on coastal environments and tidal impacts.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 5162, 5206 or 5208, 5236
Projected Offering: Spring

5247 Projects in Marine Science
(Future Course # - MS 247)
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:
Registration Restriction: Approval of Project Advisor and Program Chair
Projected Offering: Fall and Spring

5330 Geospatial Sciences I
(Future Course # - MS 330)
This course is designed to introduce students in the Marine and Environmental Science major to the fundamental concepts of Geographic Information Systems (GIS). We will explore modeling the real world within a 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. The relevance of geospatial technologies to the Coast Guard will be demonstrated through the use of case studies and guest lecturers. The laboratory portion of the course will emphasize hands-on applications of principles discussed in the lecture. Students will apply GIS principles learned in the lecture and laboratory portions of the course to a professional quality end of semester GIS project.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1104
Projected Offering: Spring

5334 Fisheries Biology
(Future Course # - MS 334)
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 fish and fisheries techniques. This course requires writing 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
Registration Restriction: MES Majors or Instructor approval for non-majors
Projected Offering: Fall

5338 Marine Forecasting
(Future Course # - MS 338)
An advanced meteorology course with an emphasis on forecasting, especially at sea. After reviewing concepts from 5236, 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: 3.50
Format: Class
Prerequisites: 5236 or 5444
Projected Offering: Spring

5342 Biological and Chemical Oceanography
(Future Course # - MS 342)
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 constituents 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: 3.50
Format: Class/Laboratory
Prerequisites: 5206, 5232, and 5241
Registration Restriction: MES Majors or Instructor approval for non-majors
Projected Offering: Spring

5350 Ocean Dynamics
(Future Course # - MS 350)
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, 5241, and 5162
Projected Offering: Fall

5379 Directed Studies in Marine Science
(Future Course # - MS 379)
Individual program of advanced readings or laboratory projects in marine science.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites:
Registration Restriction: Instructor approval
Projected Offering: Fall and Spring

5381 Capstone Research Experience 1
(Future Course # - MS 381)
Cadets develop a research proposal and a timeline for their project. Faculty advisors discuss the rubric and expectations of research at the beginning of the semester.
Credit Hours: 1.00
Format:
Prerequisites:
Projected Offering: Spring

5430 Geospatial Sciences II
(Future Course # - MS 430)
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: Fall

5435 Emergency Management
(Future Course # - MS 435)
This course introduces students to the history, principles, and applications of emergency management. Through discussions, readings, and exercises students will learn about the all-hazards approach to emergency management taken by local, state, and federal agencies and non-governmental organizations, including the private sector. Topics include the roles and responsibilities of stakeholders in all four stages in the emergency management cycle: hazard mitigation, emergency preparedness, emergency response, and disaster recovery. Field trips, case studies, and guest speakers will provide opportunities for cadets to connect principles to past and current events in emergency management and explore related career paths in the Coast Guard.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Spring

5443 Marine Ecology
(Future Course # - MS 443)
As the capstone course in the Biological-Environmental track of the Marine and Environmental Science major, this course builds upon principles explored in previous courses. Specifically, it examines ways in which biological communities interact with their physical environment to produce observed patterns in the abundance and distribution of organisms in the world's oceans. Students undertake an in-depth study of important biological interactions in nature, such as competition, predation, and mutualism, and their roles in population growth, ecological succession, and patterns in biological diversity. Attention is paid to the role of sources of disturbance in marine ecosystems. Course projects include dynamic computer modeling to evaluate the role of resource management tools in marine conservation.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 5232
Projected Offering: Fall

5444 Atmospheric and Marine Sciences
(Future Course # - MS 444)
Atmospheric and Marine Science is a survey course covering the fundamentals of meteorology (with an emphasis on weather forecasting), oceanography (including the circulation, waves, and tides), and the biology of the oceans (with an emphasis on protecting marine resources). Topics of Coast Guard interest, such as marine weather forecasting, search and rescue, pollution response, and fisheries management, are specifically addressed.
Credit Hours: 1.50
Format: Class
Prerequisites: 5102 , 5162 and either 5206 or 5266
Projected Offering: Fall and Spring

5445 Fisheries Management
(Future Course # - MS 445)
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:
Registration Restriction: MES Majors or Instructor approval for non-majors.
Projected Offering: Spring

5447 Polar Oceanography
(Future Course # - MS 447)
Polar Oceanography focuses on the physical processes in the Arctic and Antarctic regions and the international policies governing these areas. The concepts of polar climate, meteorology, and physical oceanography are discussed in order to establish a basic level of knowledge required to study the recent change in polar dynamics. Emphasis is placed on the Arctic region and its importance to Coast Guard missions. Sea ice formation and dynamics, and the resulting changes in marine shipping within the Arctic region are discussed in detail. The application of these concepts is applied through laboratory work to the Coast Guard's expanding missions within both polar regions, including search and rescue, oil spill response, and icebreaking.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 5236 or 5444
Projected Offering: Spring

5450 Waves, Tides, and Coastal Processes
(Future Course # - MS 450)
Waves, Tides, and Coastal Processes covers the time-dependent phenomena of linear ocean waves, from gravity waves to planetary-scale Rossby waves and fundamental theories of tides. In addition, the course will examine some of the important dynamics of the coastal zone, including estuarine circulation on tidal and residual time scales, pollutant dispersal and monitoring, and the interaction between estuaries and their adjacent coastal regions. In the laboratory portion of the course, students learn to apply concepts and data analysis methods presented in lecture to real data using a variety of software programs.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 5350 or Instructor's permission
Projected Offering: Fall

5459 Research in Marine Science
(Future Course # - MS 459)
Individual or team laboratory projects in marine science. Final project report and presentation at Cadet Research Symposium are required.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites:
Registration Restriction: Faculty Research Advisor and Program Chair approval
Projected Offering: Fall and Spring

5469 Research in Geospatial Sciences
(Future Course # - MS 469)
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:
Registration Restriction: Faculty Research Advisor and Program Chair approval
Projected Offering: Fall and Spring

5475 Introduction to Geospatial Sciences
(Future Course # - MS 475)
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. The 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: None
Projected Offering: Fall

5480 Capstone Research Experience 2
(Future Course # - MS 480)
The second capstone course will allow cadets to evaluate relevant data and resources and develop methodology to address questions of interest and/or test hypotheses. Faculty advisor discusses rubric and expectations of research at the beginning of the semester.
Credit Hours: 3.00
Format:
Prerequisites: 5381
Projected Offering: Fall

5481 Capstone Research Experience 3
(Future Course # - MS 481)
The third capstone course will allow 1/c cadet (group) to finalize results, submit a final report, and prepare for presentation. Faculty advisor discusses rubric and expectations of research at the beginning of the semester.
Credit Hours: 1.00
Format:
Prerequisites: 5480
Projected Offering: Spring

5493 Science Ethics Seminar
(Future Course # - MS 493)
Description: This course builds upon the ethical theory taught in 2394 Introduction to Moral and Ethical Philosophy and applies this theory specifically to Marine and Environmental Science issues through case studies and scientific papers. Emphasis is given to moral problems facing scientists in government settings. The primary goal is to stimulate critical responsible reflection on the moral issues surrounding human interaction with the environment and to provide conceptual tools necessary for pursuing those issues.
Credit Hours: 1.00
Format: Class
Prerequisites: 2394
Projected Offering: Spring

5498 Selected Topics in Marine Science
(Future Course # - MS 498)
A selection of individual topical courses developed to present information in a specific area of marine science. Course titles vary depending upon the needs and interests to the cadets and expertise of the faculty.
Credit Hours: 3.00
Format:
Prerequisites:
Projected Offering: Fall and Spring

Department of Mathematics

3107 Foundation for Calculus
(Future Course # - MAT 107)
This is a traditional pre-Calculus course for those whose Placement exam score is below the cut-off for enrollment in a Calculus course. We study functions (polynomial, exponential, logarithmic, trigonometric, and rational). Emphasis is placed on four ways of viewing a function: geometric (graphs), numeric (tables), symbolic (formulas), and written (verbal descriptions). We introduce the basics of modeling.
Credit Hours: 4.00
Format: Class/Project
Prerequisites:
Registration Restriction: Program Chair approval
Projected Offering: Fall

3111 Calculus I
(Future Course # - MAT 111)
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. A computer algebra system is utilized for both technical computations and computer analysis during the course.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 3107 or equivalent as decided by Math Service Course Program Chair
Projected Offering: Fall and Spring

3115 Calculus II (V)
(Future Course # - MAT 115)
Same topics as Calculus II (3117) treated in depth and at a pace consistent with the ability of the class. A computer algebra system is utilized for both technical computations and computer analysis during the course.
Credit Hours: 4.00
Format: Class/Project
Prerequisites:
Registration Restriction: Program Chair approval
Projected Offering: Fall

3117 Calculus II
(Future Course # - MAT 117)
Further extensive study of the fundamental concepts of differential and integral calculus. Topics include logarithmic, exponential, inverse trigonometric functions, vectors, vector valued functions, integration techniques, applications of the definite integral, improper integrals, and infinite series. A computer algebra system is utilized for both technical computations and computer analysis during the course.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 3111

Projected Offering: Spring and Summer

3142 Data Exploration and Visualization
(Future Course # - MAT 142)
An introduction to data exploration and visualization using the software tools of Excel, Python, and ArcGIS. The course will focus on how to find, read, work with, analyze, and communicate data. Topics will include built-in functions, pivot tables, and plots in Excel; and importing, analyzing, and visualizing data using Python and ArcGIS. The course will also require students to grapple with questions of data ethics and methods of data communication.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: None
Projected Offering: Fall and Spring

3201 Exploratory Data Analysis
(Future Course # - MAT 201)
This course provides an introduction to data science using R. Topics include how to import data into R, how to structure, transform, and clean the data so that it will be useful for the analyses, and how to explore the data and create plots to visualize both univariate and multivariate data. Other emphases are problem definition, communicating information in and about graphics, and data ethics.
Credit Hours: 2.00
Format: Class
Prerequisites: None
Projected Offering: Spring

3211 Multivariable Calculus
(Future Course # - MAT 211)
An introduction to differential and integral calculus for functions of several variables. Topics include surfaces in three-dimensional space, partial differentiation, multiple integration, and vector calculus. A computer algebra system is utilized for both technical computations and computer analysis during the course.
Credit Hours: 3.00
Format: Class
Prerequisites: 3115 or 3117
Projected Offering: Fall and Spring

3213 Probability and Statistics
(Future Course # - MAT 213)
An exploration of the basic concepts and rules of probability, as well as the fundamentals of statistics. Utilizing a data analysis computer program, students learn to explore, describe, and summarize 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.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3111
Projected Offering: Fall and Spring

3215 Differential Equations
(Future Course # - MAT 215)
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: Spring

3216 Ordinary Differential Equations and Linear Algebra with Applications
(Future Course # - MAT 216)

An introductory course in applied ordinary differential equations and applied linear algebra focused on engineering applications. Topics include systems of first order differential equations, systems of higher order linear differential equations, complex numbers and functions, Fourier Series, Laplace transforms, vectors, matrix algebra, symmetric and orthogonal matrices, orthogonality, matrix factorization, eigenvalue problems, the spectral theorem, & singular value decomposition. This is a project intensive course.
Credit Hours: 3.50
Format: Class
Prerequisites: 3115 or 3117
Projected Offering: Fall and Spring

3221 Linear Algebra
(Future Course # - MAT 221)

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

3231 Linear Optimization
(Future Course # - MAT 231)

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, and 3221 or instructor and ORDA Program Chair approval
Projected Offering: Spring

3235 Computer Modeling Languages
(Future Course MAT # - 235)

An introduction to programming languages for computer modeling. Topics include programming fundamentals, decision structures, data structures, algorithms, objects, and software design. Exercises with an emphasis on mathematical applications enable students to design and build effective computer programs.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3115 or 3117, and 1104 or permission of instructor
Projected Offering: Fall

3237 Discrete Mathematics
(Future Course # - MAT 237)

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: None
Projected Offering: Spring

3238 Algorithms with Applications
(Future Course # - MAT 238)
This course is designed to further the student's ability to solve mathematical applications via computer programming. New programming concepts and structures will be introduced, such as Linked Lists, Stacks, Queues, Trees, Sorting, Graphs, and Recursion. An emphasis will be placed on a student's ability to implement a mathematical application using a computer language.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3235 or permission of instructor or department-approved validation
Projected Offering: Fall

3301 Advanced Engineering Mathematics
(Future Course # - MAT 301)
An upper division course for Engineering majors designed to provide a background and working knowledge of Linear Algebra and Probability and Statistics. The primary objectives are to develop a basic understanding of matrix algebra techniques and probability and statistical 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

3333 Network and Nonlinear Optimization
(Future Course # - MAT 333)
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

3334 Intermediate Deterministic Models
(Future Course # - MAT 334)
In this course, students will increase their capabilities for solving problems in Operations Research. This course will focus on problem statements that may be ambiguous or incomplete, large-scale project formulation, and computer-based solution techniques. Tools to be used in solving the projects will be drawn from the following areas: linear programming, mixed-integer programming, combinatorial optimization, multiple-objective optimization, nonlinear optimization, network optimization and others.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3235 and 3333, or permission of instructor
Projected Offering: Spring

3336 Information Systems
(Future Course # - MAT 336)
An introduction to the process of transforming data into information for the purposes of deriving insight and guiding decisions. Topics include concepts of computer information systems and data science; data collecting, cleaning and processing in Python (or equivalent); relational database management and the essentials of Access database technology and structured query language (SQL); designing, developing, and utilizing Decision Support Systems including through the use of VBA in conjunction with MS Excel and Access. Exercises and projects 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: 3235 or permission of instructor
Projected Offering: Spring

3338 Advanced Cryptography
(Future Course # - MAT 338)
Intended as a 2nd-semester follow on course for those who have taken basic Cryptography (7238). Topics include finite fields, elliptic curves, DES, AES, Block ciphers, Hash functions, and Digital signatures.
Credit Hours: 3.00
Format:
Prerequisites:
Projected Offering: Spring

3339 Data Science Techniques
(Future Course # - MAT 339)
This 1-credit course provides an intermediate-level treatment of data science techniques building off of the foundation of material introduced in the soon-to-be-launched 32xx EDA course and 3336 Information Systems. Content learned in this course will be put to use by students later in 3449 Statistical Learning and in the 34XX Operations Analysis capstone course. Some of the techniques covered include intermediate data processing/analysis/curation, project pipelining, and data visualization via dashboards. Computer implementation of techniques will be a major emphasis.
Credit Hours: 1.00
Format: Class/Project
Prerequisites: 3201 and 3336
Projected Offering: Spring

3341 Probability Theory
(Future Course # - MAT 341)
A rigorous development of probability theory is 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
(Future Course # - MAT 343)
A mathematical development of sampling distributions and the methods and theory of statistical procedures such as point estimation, confidence intervals, and hypothesis tests design. Topics include the Neyman-Pearson Lemma, generalized likelihood ratio testing, contingency tables, and goodness of fit. Computer analysis is utilized.
Credit Hours: 3.00
Format: Class
Prerequisites: 3341
Projected Offering: Spring

3347 Linear Regression
(Future Course # - MAT 347)
The fundamental development of simple and multiple linear regression models is discussed with emphasis on estimation and inference techniques and the associated assumptions. Forecasting models are also discussed. Computer analysis is utilized.
Credit Hours: 3.00
Format: Class/Project
Corequisite: 3343

Projected Offering: Spring

3449 Statistical Learning
(Future Course # - MAT 449)
This course will provide an introduction to supervised and unsupervised statistical learning methods. Supervised methods include advanced linear regression topics (subset selection, shrinkage methods, dimension reduction methods, and others) and classification methods (logistic regression, linear discriminant analysis, and others). Unsupervised learning methods discussed include principal components analysis and clustering methods. Other topics include resampling methods such as cross-validation and the bootstrap. The course builds on the material in Mathematical Statistics and Linear Regression and the focus is on analyzing and understanding complex data sets. Computer analysis is utilized.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3347, 3343
Projected Offering: Fall

3453 Decision Models
(Future Course # - MAT 453)
An introduction to decision analysis, risk, utility theory, Markov chains, game theory, 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
(Future Course # - MAT 463)
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

3470 Operations Analysis Preparation
(Future Course # - MAT 470)
A capstone preparation course including familiarization with software and prior capstone reports, project selection and interaction with project sponsors. Skills related to formulation of problem statements, identifying data requirements as well as reading, writing and presenting technical reports are emphasized. Required for all Operations Research and Data Analytics majors during the fall semester of 1/c year unless waived by the Department Head of Mathematics.
Credit Hours: 1.00
Format: Class/Project
Prerequisites: None
Projected Offering: Fall

3471 Operations Analysis
(Future Course # - MAT 471)
A capstone project course applying mathematical, statistical, computer programming and/or operations research techniques to problems related to Coast Guard missions and other areas of interest. This course meets the capstone requirement.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 3347, 3470

Projected Offering: Spring

3473 Problem solving with Operations Research
(Future Course # - MAT 473)
A project-based capstone course applying mathematical, statistical, computer programming and/or operations research techniques applicable to solving various real-world problems. This course meets the capstone course requirement.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 3449, 3470
Projected Offering: Spring

3479 Directed Studies in Operations Research
(Future Course # - MAT 479)
A semester of individual work on a topic approved by the Department Head of Mathematics.
Credit Hours: 1.00-3.00
Format: Directed Studies
Prerequisites: Topic Dependent
Registration Restriction: Permission of Instructor
Projected Offering: Fall and Spring

3482 Selected Topics in Mathematics
(Future Course # - MAT 482)
This course will explore advanced topics in mathematics. Potential topics include advanced calculus, complex variables, intermediate differential equations, and topology. Specific course content will vary based on institutional and organizational needs, student and faculty interest, and current topics in the field.
Credit Hours: 3.00
Format: Class
Prerequisites: Topic Dependent
Registration Restriction: Permission of Instructor
Projected Offering: Fall or Spring

3483 Selected Topics in Operations Research
(Future Course # - MAT 483)
This course will explore advanced topics in operations research. Potential topics include continuous time simulation, game theory, and advanced topics in optimization. Specific course content will vary based on institutional and organizational needs, student and faculty interest, and current topics in the field.
Credit Hours: 3.00
Format: Class
Prerequisites: Topic Dependent
Registration Restriction: Permission of Instructor
Projected Offering: Fall or Spring

3484 Selected Topics in Statistics
(Future Course # - MAT 484)
This course will explore advanced topics in statistics. Potential topics include statistical learning, non-parametric statistics, Bayesian statistics, robust statistics and exploratory data analysis. Specific course content will vary based on institutional and organizational needs, student and faculty interest, and current topics in the field.
Credit Hours: 3.00
Format: Class
Prerequisites: Topic Dependent
Registration Restriction: Permission of Instructor
Projected Offering: Fall or Spring

3485 Selected Topics in Computer Analysis
(Future Course # - MAT 485)
This course will explore advanced topics in computer analysis. Potential topics include algorithms, complexity, numerical analysis and programming languages. Specific course content will vary based on institutional and organizational needs, student and faculty interest, and current topics in the field.
Credit Hours: 3.00
Format: Class
Prerequisites: Topic Dependent
Registration Restriction: Permission of Instructor
Projected Offering: Fall or Spring

Department of Mechanical Engineering

1208 Introduction to Mechanical Engineering Design
(Future Course # - ME 208)
Techniques of engineering design and problem solving. Introduction to computer use in the design process including analytical tools and computer-aided design and some exposure to introductory programming. 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: None
Projected Offering: Spring

1347 Fundamentals of Astronautics
(Future Course # - ME 347)
Astronautics is a broad field of study that includes orbital mechanics, rocket propulsion, rendezvous, remote sensing, spacecraft systems design, and space mission operations. Cadets will understand the complexities and challenges of the space environment and learn how to mitigate those challenges through iterative design, architectural redundancy, quality control in production and processing, as well as rigorous integrated testing. Broad topic areas include small satellites, human spaceflight, and the unique challenges associated with deep space / interplanetary exploration. Cadets will improve their problem-solving skills and quantitative literacy by logically solving problems in orbital dynamics, spacecraft systems design, mission planning and spacecraft systems design.
Credit Hours: 3.00
Format: Class
Prerequisites: 5162
Projected Offering: Fall and Spring

1351 Thermodynamics
(Future Course # - ME 351)
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, psychometrics, and to the design of thermal processes.
Credit Hours: 3.00
Format: Class
Prerequisites: 3211, 5206, and 5162
Projected Offering: Fall

1353 Thermal Systems Design
(Future Course # - ME 353)
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: Fall

1370 Mechanisms
(Future Course # - ME 370)
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: 1208 and 1211 (with a grade of C or higher in both)
Projected Offering: Fall

1437 Engineering Experimentation
(Future Course # - ME 437)
Experimental data analysis using uncertainty theory, curve-fitting, and statistical criteria. Data acquisition with electronic instrumentation and commercial software, 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. Weekly labs expand on the concepts of experimental design learned in class, and focus on the analysis of mechanical, fluid, and thermal systems. The course includes an experimental design project where cadets reproduce results described in professional literature.
Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 1211 (with a grade of C or higher), 1321, 1340, 1351, and 3213 or 3301
Projected Offering: Fall

1440 Machine Design
(Future Course # - ME 440)
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 (with a grade of C or higher), 1370
Projected Offering: Spring

1446 Mechanical Engineering Design
(Future Course # - ME 446)
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 and 1480
Projected Offering: Spring

1459 Heat Transfer
(Future Course # - ME 459)
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: 1340, 1351, and 1212 or 3215
Projected Offering: Spring

1460 Modeling and Control of Dynamic Systems
(Future Course # - ME 460)
The course introduces fundamental concepts of automatic control systems in the time and frequency domains. Classical control theory approach to modeling is addressed with emphasis in mechanical and electromechanical systems. Content of open and closed loop feedback control systems include: feedback analysis, stability, tracking, and regulation of complex systems. Steady state and transient system response is evaluated for static and dynamic compensation. Controller tuning rules are presented, together with treatment of practical PID implementation.
Credit Hours: 3.00
Format: Class
Prerequisites: 1211 (with a grade of C or higher), 1321, and 3215
Projected Offering: Fall

1461 Mechatronics
(Future Course # - ME 461)
The course introduces fundamental concepts of mechatronic systems via the combined study of mechanisms, electronics, actuators, sensors and control. Topics are presented in a practical, simplified manner, with the use of a widely available microcontroller. Subjects covered include digital and analog sensors, pulse width modulation, actuator control, basic electronic circuitry, microprocessor programming, and classical control theory. Static and dynamic performance is evaluated utilizing empirical PID algorithms. A fully automated mechanism, merging hardware and software components, serves as the final design project.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Spring

1466 Heating, Ventilation, and Air Conditioning Principles
(Future Course # - ME 466)
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

1479 Directed Studies in Mechanical Engineering
(Future Course # - ME 479)
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:
Registration Restriction: Approval of Advisor and the Program Chair
Projected Offering: Fall and Spring

1480 Design Project management
(Future Course # - ME 480)
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: 4.00
Format: Class/Laboratory
Prerequisites: 1208 (with a grade of C or higher)
Corequisite: 1440
Registration Restriction: 1/c Engineering Major
Projected Offering: Fall

Department of Naval Architecture and Marine Engineering

1101 Introduction to Experiential Engineering I
(Future Course # - NAME 101)
This course introduces 4/c cadets in the School of Engineering and Cyber Systems (SECS) to engineering skills through a hands-on experience using engineering tools (software and hardware) for design and fabrication. Students will participate in design and build activities applicable to their interests. Projects will contain both individual and team-based components. This course is also designed to build community, support and mentorship during students first year as an Engineering or Cyber Systems Major. All projects will be run on a Sat/Unsat grading requirement. This is an elective course.
Credit Hours: 1.00
Format: Class
Prerequisites: None
Projected Offering: Fall

1102 Introduction to Experiential Engineering II
(Future Course # - NAME 102)
This course introduces 4/c cadets in the School of Engineering and Cyber Systems (SECS) to engineering skills through a hands-on experience using engineering tools (software and hardware) for design and fabrication. Students will participate in design and build activities applicable to their interests. Projects will contain both individual and team-based components. This course is also designed to build community, support and mentorship during students first year as an Engineering or Cyber Systems Major. All projects will be run on a Sat/Unsat grading requirement. This is an elective course and a continuation of 1101.
Credit Hours: 1.00
Format: Class
Prerequisites: None
Projected Offering: Spring

1211 Dynamics
(Future Course # - NAME 211)
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: 1118 (with a grade of C or higher) and 1212 and 5162
Co-requisite: 3215 for ME majors only
Projected Offering: Spring

1241 Laboratory in Naval Architecture
(Future Course # - NAME 241)
A once-weekly introductory laboratory for Naval Architecture & Marine Engineering majors that combines lectures with hands-on activities, group problem solving, and basic NA&ME software experiences. This lab builds directly on the Ships and Maritime Systems course to advance the material beyond the level of a Professional Mariner, to the level of a novice Naval Architect. Topics include vessel design, drawing of ship's lines, computation of hull quantities, design & stability software, visits to vessels, design & 3-D print activities, hull form selection, flooding, ship structures, shipboard power-plants, introduction to planing and sailing craft, and hands-on experience with floating models.
Credit Hours: 1.00
Format: Laboratory
Prerequisites: 1118 and 5162
Corequisite: 6201
Projected Offering: Fall

1242 Applied Naval Architecture and Marine Engineering
(Future Course # - NAME 242)
This course builds on introductory naval architecture skills to allow students to perform vessel concept design and analysis. Design and analysis theory is presented and paired with hands-on experiences with floating models, design/analysis software, and design competition to teach about flooding, stability, hull resistance, and motions in a seaway. Students are introduced to hand drawing, vessel propulsion, shipboard systems, ship structures, and review of ship's plans. Students build proficiency with NA&ME design and analysis software - Rhinoceros/ORCA for hull design, GHS for stability and loading analysis, and NAVCAD for resistance prediction.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 6201 (with a grade of C or higher) and 1241
Projected Offering: Spring

1318 Engineering Material Science (formerly 1204, effective Fall 2021)
(Future Course # - NAME 318)
Introduction to materials science and engineering for engineers with an emphasis in crystalline structure and defects, dislocation theory, diffusion, mechanical properties, fracture, strengthening mechanisms, phase transformations, fatigue, creep, corrosion, and welding for various materials, such as metal alloys and composite materials. Lab experiments and demonstrations include: cold rolling and annealing, Charpy impact testing, Jominy end-quench, casting, forging, welding, composites, and non-destructive testing.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5206 or 5208
Projected Offering: Fall

1340 Fluid Mechanics
(Future Course # - NAME 340)
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: 3211, 5162, and a grade of C or higher in 1118
Projected Offering: Fall

1355 Marine Engineering
(Future Course # - NAME 355)
This is a first course in Marine Engineering. It addresses the design and operation of machinery onboard ships and boats. Thermodynamics and electricity are reviewed and applied to shipboard propulsion and electric power. Energy conversion, power plant concepts, and shipboard main machinery are studied. Diesel engines, gas turbines, and shipboard auxiliary systems are studied.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1351
Projected Offering: Spring

1356 Ship Structures
(Future Course # - NAME 356)
This course introduces the design and analysis of ship structures. 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 reviewed, as well as hull materials and vessel construction methods. The course includes homework, exams, and a model scale structural design and construction project. The model scale project provides an opportunity to apply and integrate the basic principles of buoyancy, stability, and ship structures. Computer analysis of ship structures is introduced and applied to the model scale project.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1206 and 1242 (with a grade of C or higher), 1318 and 3213 or Permission of Instructor
Projected Offering: Spring

1433 Aerodynamics – Fundamentals and NACA
(Future Course # - NAME 433)
This course explores fundamental aerodynamic principles and their applications. Topics include Mach Number (subsonic and supersonic flight), Reynolds Number (laminar and turbulent flow), analytical and numerical computation methods, and experimental techniques such as wind tunnel testing. Discussions of NACA airfoils and the transition from NACA to NASA will also be covered. Assessments will include a midterm, final paper, and a project.
Credit Hours: 3.00
Format: Class
Prerequisites: 1340 or 5350
Projected Offering: Spring

1442 Principles of Ship Design
(Future Course # - NAME 442)
This course involves extensive use of the design process to produce the preliminary design a U.S. Coast Guard or Commercial vessel. The application of estimation and iteration procedures are applied to topics such as: similar ships analysis, preliminary hull dimensions, watertight subdivision, development of general arrangements, weight estimation and intact stability analysis. Computer Aided Design software and state-of-the-art analysis tools are implemented to develop ship lines and hydrostatic characteristics and well as assess ship intact stability in various loading conditions. This course runs concurrently with the Ship Propulsion Design course (1453). The project is completed in the Ship Design/System Integration (1444) course.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 1242 (with a grade of C or higher), 1355, 1356
Registration Restrictions: 1/c only

Projected Offering: Fall

1444 Ship Design/System Integration
(Future Course # - NAME 444)
This course focuses on completing the ship design initiated in Principles of Ship Design (1442) course with an emphasis on ship and system integration. Topics include: longitudinal ship strength, ship structural design, geometrically scaled model hull construction and resistance testing, damage stability, seakeeping and operability, crewing and cost. Project management, engineering economics, engineering ethics and technical risk assessment are also covered.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 1356, 1442, 1453
Registration Restriction: 1/c only
Projected Offering: Spring

1447 Marine Casualty Response
(Future Course # - NAME 447)
Provides a basic application of engineering principles used during marine casualty response operations, i.e., ship collisions, allisions, groundings, and marine firefighting. The course expands on the basic fundamentals of naval architecture, marine structures, and statics to solve real-world engineering problems created by marine casualties. Hands-on learning and case studies of real-world marine casualties are used as the backdrop for applying engineering fundamentals. Basic concepts include: vessel nomenclature, hydrostatics, intact and damaged stability, trim, hull girder strength, evaluation of secondary and local structural strength, basic damage control, and environmental factors, as well as USCG roles and responsibilities.
Credit Hours: 3.00
Format: Class
Prerequisites: 1206 and 6201
Projected Offering: Fall

1453 Ship Propulsion Design
(Future Course # - NAME 453)
An advanced marine engineering design course requiring the application of sound judgment and analysis to engineering decisions. Working concurrently with the Principles of Ship Design course (1442), students optimize and design a propulsion system for their senior design that meets specific operating specifications. Significant emphasis is placed on technical/scientific/professional writing through design reports, as well as multiple individual homework assignments. Topics covered include hull resistance, hull vibration, propulsor selection, engine selection, engine and propulsor matching, electric drive and integrated power systems, electrical load analysis, reduction gear selection and design, engine room layout, shafting design and shaft vibration analysis. The project is completed in the Ship Design/System Integration course (1444).
Credit Hours: 4.00
Format: Class/Lab/Project
Prerequisites: 1242 (with a grade of C or higher), 1321 and 1355
Projected Offering: Fall

1457 Small Craft Design
(Future Course # - NAME 457)
Small Craft Design offers the opportunity to create a comprehensive first design of a small sailboat and powerboat. Tailored to the amateur sailing or boating enthusiast with an engineering background, this course will build upon the prerequisite stability, structural, resistance, and computational analysis techniques as applied to the Design Spiral. Boat design and construction will be discussed in theory and in practice to provide the student with an expanded understanding of the boat and sea interface. The course balances engineering and creativity through the design of a small craft from scratch. Computer Aided Design (CAD) will be relied on heavily, with reference to classical boat design methodology and current classification society rules and guidance. A final design will be created through an understanding of the necessary relationships between hull geometry, hydrostatics, stability, resistance/power, keel/rudder/sail design, structure, hull and rig construction, and materials.
Credit Hours: 3.00

Format: Class/Project
Prerequisites: 1242 (with a grade of C or higher), 1318 and 1340
Projected Offering: Spring

1468 Advanced Study in Naval Architecture and Marine Engineering
(Future Course # - NAME 468)
Individual or group study (reading, research, design, analysis, validation, or application) - beyond the standard curriculum - under the direct supervision of a NA&ME faculty member(s). Examples include creation of hardware, computer design/analysis, experimental work, or research study. Final written report required. A weekly faculty-cadet meeting is expected, and cadets shall spend a total of at least 2.5 hours - per credit hour - per week on this course. Cadets may repeat this course for credit with a new focus. Proposals must be approved prior to the beginning of the semester using the Registrar's "Directed Study, Project or Research" Approval Form.
Credit Hours: 0.5-4.00
Format: Directed Study or Project or Research
Prerequisites:
Registration Restriction: NA&ME major and Program Chair Approval
Projected Offering: Fall and Spring

1469 Advanced Research in Naval Architecture and Marine Engineering
(Future Course # - NAME 469)
Original, individual or group scholarship of topics involving advanced design, analysis, or innovative applications in NA&ME under the supervision of a NA&ME faculty committee. Formal written report and presentation – such as at the Cadet Research Symposium - are required. Cadets shall spend a total of at least 2.5 hours - per credit hour - per week on this course. Cadets may repeat this course for credit with a new focus. Proposals must be approved prior to the beginning of the semester using the Registrar's "Directed Study, Project or Research" Approval Form.
Credit Hours: 3.00-4.00
Format: Directed, Independent Research
Prerequisites:
Registration Restriction: 1/c or 2/c NA&ME major and Program Chair Approval
Projected Offering: Fall and Spring

6201 Ships and Maritime Systems
(Future Course # - NAME 201)
Provides fundamental technical knowledge of ships and maritime systems. A baseline understanding is developed to support future assessment of impact, benefit, and risk of decisions involving design, acquisition, operation, regulation, law enforcement, damage control, maintenance, and salvage of ships and maritime systems. Specific subject areas include international/domestic rules and regulations, intact and damage stability, marine structures, ship propulsion, primary and auxiliary ship systems, marine salvage, ship motions, ship handling, and offshore structures.
Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 5162, 6101 and 3/c Summer Training Program
Projected Offering: Fall and Spring

Department of Nautical Science

6101 Fundamentals of Navigation
(Future Course # - NS 101)
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 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, tactical characteristics, coastal and transoceanic voyage planning, and aids to navigation. The celestial navigation module focuses on time of phenomena, coordinate systems, celestial and navigational triangles, gyrocompass

error by azimuth and amplitude, and solving for latitude by observations of local apparent noon and Polaris. This course is required 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 that the students submit in a written form.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: None
Projected Offering: Fall and Spring

6202 Applications in Navigation
(Future Course # - NS 202)
Applications of Navigation is a lab based course that meets three times 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 relative motion fundamentals, navigation evaluation, and voyage planning. The first 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. 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 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. This course is a prerequisite for the 2/c Summer Training Program.
Credit Hours: 1.00
Format: Laboratory
Prerequisites: 6101
Projected Offering: Fall and Spring

6210 Private Pilot Ground School
(Future Course # - NS 210)
The Private Pilot Ground School course covers the material needed to successfully pass the FAA Private Pilot Knowledge Test. Completion of the course qualifies the student to take that FAA Private Pilot Knowledge Test which is one of the requirements for a Private Pilot License. The subjects covered include aerodynamics, aircraft systems, flight instruments, weight and balance, aircraft performance, weather, airspace, navigation, aeromedical factors, and FAA and NTSB regulations.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Registration Restriction: Students with FAA certificates above Drone Operator are ineligible.
Projected Offering: Fall

6301 The Maritime Watch Officer
(Future Course # - NS 301)
The Maritime Watch Officer course focuses on the knowledge and skills vital to successful performance as a Maritime Watch Officer. This course builds upon individual navigation proficiency gained during the prerequisite courses and summer training programs and introduces new watch team skills applicable to maritime watches. In addition to refreshing navigation team skills taught in Fundamentals of Navigation and Applications in Navigation, students will 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 ship handling 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. Risk based decision making 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

6310 Marine Safety Professional
(Future Course # - NS 310)
This course provides a detailed overview of Coast Guard Marine Safety missions that are executed at Sectors through marine inspectors, waterways management, and casualty investigations. Cadets will learn about the Coast Guard's roles and authorities for ensuring the safety and security of federal waterways and improve their critical thinking about real-world maritime challenges that exist in the Marine Transportation System. Specifically, this course will help cadets appreciate the importance of the Coast Guard's role in international maritime trade and facilitating commerce throughout the United States. Emphasis is placed on the knowledge and skill sets, e.g., risk management, decision making, etc., required for junior officers and provides cadets direct exposure to career opportunities in the Marine Safety program.
Credit Hours: 3.00
Format: Class
Prerequisites: 6201
Projected Offering: Spring

6401 Professional Maritime Officer
(Future Course # - NS 401)
This capstone course integrates previous nautical science topics in Professional Maritime Studies to prepare cadets to pass the National Maritime Center approved Master – 100 gross tons near coastal licensing examination. This course will focus on four major areas of study from 46 CFR 11.910, which governs the required subjects of instruction for deck officer endorsements. The four areas of study are Deck – Safety, Deck – General, Navigation – General and Navigation Problems – Chart Plot.
Credit Hours: 3.00
Format: Class
Prerequisites: 6101, 6201, 6202, 6301
Projected Offering: Fall and Spring

6402 Professional Maritime Officer Laboratory
(Future Course # - NS 402)
Lab assignments in the bridge simulators and aboard 65-foot training vessels will develop critical thinking and decision-making skills in navigation and ship handling while also reinforcing Bridge Resource Management concepts through effective leadership and communication. Upon completion of this course and successfully passing the final examination, cadets will be eligible to apply for a Master – 100 gross tons near coastal license.
Credit Hours: 1.00
Format: Laboratory
Prerequisites: 6101, 6201, 6202, 6301
Projected Offering: Fall and Spring

6459 Selected Topics in Professional Maritime Studies
(Future Course # - NS 459)
In depth examination of a terrestrial, celestial, or electronic navigation topic or a stability, damage control, ship handling, 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
(Future Course # - NS 469)
Start-up, involvement, or completion in a project involving data collection, synthesis and/or analysis. Specific course content will vary based upon emerging and relevant navigation, training, leadership, institutional or organizational topics. A 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
(Future Course # - NS 489)
Advanced tutorial concentrating on specific topics in the area of cutter, sector or aviation operations. 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

Department of Physics

5162 Physics I
(Future Course # - PHY 162)
Basic concepts of Newtonian mechanics, particle kinematics and dynamics, rotational kinematics and dynamics, conservation laws, oscillations, fluids, and wave motion. This is a calculus-based course.
Credit Hours: 4.00
Format: Combined Class and Laboratory
Prerequisites: None
Corequisite: 3111
Projected Offering: Spring

5257 Projects in Physics
(Future Course # - PHY 257)
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:
Registration Restriction: Approval of Project Advisor, Physics Department Head, and MES Program Chair
Projected Offering: Fall and Spring

5266 Physics II
(Future Course # - PHY 266)
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, Ampere's law, and optics. This is a calculus-based course.
Credit Hours: 4.00
Format: Combined Class and Laboratory
Prerequisites: 3111 and 5162
Projected Offering: Fall

5366 Astronomy
(Future Course # - PHY 366)
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, 5206
Projected Offering: Occasional

5367 Remote Sensing
(Future Course # - PHY 367)
This course explores the fundamentals of remote and in-situ sensing of the land, air, and sea environment. Emphasis is placed on applications to various scientific fields and the Coast Guard. Students study the theory behind environmental sensing; investigate image acquisition and data collection in various regions of the electromagnetic spectrum using current satellites; and explore data presentation, analysis and interpretation.
Credit Hours: 3.00
Format: Class
Prerequisites: None
Projected Offering: Fall

5368 Energy Production
(Future Course # - PHY 368)
The Energy Production course examines energy from various sources, its conversion into electrical power through heat engines and electrical generation, and its uses in society. The course follows energy flow through the environment, energy storage and distribution, efficiency, and conservation.
Credit Hours: 3.00
Format: Class
Prerequisites: 3117 and 5266
Projected Offering: Spring

5389 Directed Studies in Physics
(Future Course # - PHY 389)
Individual program of advanced readings or laboratory projects in physics.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 5266
Registration Restriction: Instructor and Physics Department Head approval
Projected Offering: Fall and Spring

5495 Selected Topics in Physics
(Future Course # - PHY 495)
Description: Specialized topics in physics not covered in any other courses.
Credit Hours: 3.00
Format: Lecture/Seminar
Prerequisites: TBD
Projected Offering: Fall and Spring