

# MAINE MARITIME ACADEMY



## UNDERGRADUATE CATALOG ACADEMIC YEARS 2010-2011



Updated 02/04/2011

# Maine Maritime Academy

## Undergraduate Catalog for the Academic Year 2010-2011\*

### VISION STATEMENT

Maine Maritime Academy is a career-oriented college that strives to continue to be the globally recognized leader in providing the highest quality maritime, engineering, engineering technology, marine science, and logistics education with facilities and laboratories that are at the leading edge of technological innovation.

### MISSION STATEMENT

The mission of Maine Maritime Academy is to provide a quality education primarily focused on marine related programs. The curriculum will empower students to take on leadership roles, encourage rigorous self-discipline, promote curiosity, and provide graduates with the skills and knowledge needed to succeed in the global economy.

### INSTITUTIONAL OBJECTIVES

To qualify for the baccalaureate degree, students should, at the appropriate level:

- Demonstrate competency in written and spoken English
- Apply scientific methodology, apply basic concepts of mathematics and science, and be computer proficient
- Gain a perspective of the social sciences, including knowledge about the interaction of human groups, of world and U.S. history, institutions, and economic systems
- Demonstrate an ability to reflect on the impact of technology on society, which should inform intelligent action
- Acquire a basic knowledge of the humanities, such as literature, art, and music, and appreciate their impact on the individual and on society
- Gather, analyze, and interpret information
- Demonstrate competency in a major field and understand its relevance to a profession

Furthermore, a baccalaureate degree assumes a capability to:

- Deal creatively and realistically with personal, community, national, and international concerns
- Think logically, act rationally, and make appropriate decisions about the future based on past and present conditions and circumstances
- Understand ethics and aesthetics that provide a foundation for the development of a value system that can be translated into effective social action
- Cultivate a sense of curiosity, a sense of beauty and practical wisdom in life

### ACCREDITATION

Maine Maritime Academy is accredited by the New England Association of Schools and Colleges, Inc., 209 Burlington Road, Bedford, MA 01730; telephone (781) 271-0022.

The Marine Engineering Technology program is accredited by the Technology Accreditation Commission of ABET, 111 Market

Place, Suite 1050, Baltimore, MD 21202-4012; telephone (410) 347-7700.

The Power Engineering Technology program is accredited by the Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; telephone (410) 347-7700.

The Marine Systems Engineering program is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; telephone (410) 347-7700.

The STCW (Standards of Training, Certification and Watchkeeping) components of designated courses at Maine Maritime Academy are accredited by the United States Coast Guard, National Maritime Center, 100 Forbes Drive, Martinsburg, WV 25404.

Maine Maritime Academy also holds membership in the American Association of State Colleges and Universities, the Council for the Advancement and Support of Education, the Downeast College Consortium, and the International Association of Maritime Universities. The Academy is authorized under federal law to enroll non-immigrant alien students.

It is the policy of Maine Maritime Academy to provide equal opportunity and treatment to all students, employees, and applicants in all areas of the Academy. No person shall be discriminated against because of race, religion, color, gender, age, sexual orientation, national origin, handicap, or veteran's status.

Maine Maritime Academy subscribes to the principles and policies encompassed by the Uniform Campus Crime Reporting Act. A general overview of campus safety and security issues is made available to all students and employees. (<http://security.mma.edu/>)

An audited Financial Statement is produced following the end of each fiscal year. For a copy, please request one by writing to the Maine Maritime Academy Office of Administration, Finance, and Governmental Relations.

The Academy reserves the right to make changes in its rules, regulations, procedures, degree requirements, and fees.

Published in 2009 by Maine Maritime Academy, Castine, Maine 04420.  
Dr. John Barlow, Editor.

\* The Maine Maritime Academy Undergraduate Catalog is published online and updated monthly during the Academic Year. The latest monthly update time is posted in the upper left hand corner of each section. Archived copies are available in the Academic Dean's office and the Nutting Memorial Library, as well as online.

## ONLINE CATALOG

The Maine Maritime Academy "online" Undergraduate Catalog is updated monthly no later than the 20<sup>th</sup> of each month from September through May. Each section contains a small heading, "This section last updated mm/dd/yy". This heading is updated each time that revisions are made within that section. All updates are approved and published by the Academic Dean.

Undergraduate Catalog revisions should be submitted to the Academic Dean's office by the 15<sup>th</sup> of each month.

- Academic Program: The Registrar's office will be responsible for submitting all curriculum revisions approved by the Faculty Senate to the Academic Dean. The Registrar's office will assign course numbers and assure that course descriptions are complete, proper credit hours are assigned and prerequisites listed. The Academic Department Chairs are responsible for periodically reviewing the catalog and submitting revisions of their program descriptions, listed faculty, etc.

The personnel below will be responsible for submitting changes to their respective catalog sections:

- Director of Admission: Admissions
- Director of Financial Aid: Affording and Financial Aid Policies
- Director of Finance: Affording
- Dean of Student Services: Student Life
- Executive Assistant to the President: Directory
- Executive Assistant to the Dean: Academic Calendar.

- Associate for Public Affairs: format or miscellaneous information and matters of general concern.

## Contact Information

### Telephone

(207) 326-4311

In Maine: (800) 464-6565

Out of State: (800) 227-8465

### FAX

(207) 326-2109

### Postal address

Pleasant Street, Castine, ME, U.S.A., 04420

### Electronic mail

General Information: [admissions@mma.edu](mailto:admissions@mma.edu)

Web site: <http://www.mainemaritime.edu>

Internal Web site: <http://www.mma.edu>

## A Proud Heritage

FOR GENERATIONS, Maine has been known worldwide for the skills of its shipbuilders and sea captains, and for leadership in every phase of maritime affairs. It was in Maine that the first English ship built in America, the *Virginia*, was launched in 1607, and, in this new century, Mainers continue to build and sail vessels ranging from custom yachts to mighty warships. Windjammers, fishing fleets, and defenders of the America's Cup have all been part of Maine's seafaring tradition.

Today this proud heritage thrives at Maine Maritime Academy, an institution of higher learning providing undergraduate and graduate instruction in engineering, transportation, marine sciences, maritime management, international business and logistics, and small vessel operations. In addition, the college prepares a portion of its students as officers for the U.S. Merchant Marine and for the armed forces of the United States.

Proposals for an institution devoted to nautical training began in Maine in the 1930s. Educational and civic leaders throughout the state -- led by Senator Ralph Leavitt of Portland -- prompted the creation of Maine Maritime Academy by an act of the 90th Maine Legislature on March 21, 1941.

The original class of 29 students reported on October 9 of that year to Rear Admiral Douglas Dismukes, USN, a veteran of World War I who came out of retirement to head the fledgling school. Classes met on the campus of the Eastern State Normal School, with students lodged at Castine's Pentagoet Inn. The *Mattie*, a coastal schooner out of Camden, Maine, served as the first training ship.

World War II required a rapid build-up of the U.S. Merchant Marine, with a critical need for new deck and engineering officers. The Academy met that challenge, producing more than 300 officers who served at sea during the war in every theater of operations. Three gave their lives in service to the nation, and many others were wounded in action. By war's end, Maine Maritime had graduated 384 men.

In the post-war era, the program was expanded to the original concept of a three-year course leading to a Bachelor of Science degree. In the 1960s and 70s, Rear Admiral Edward Rodgers, USMS, led a multi-million dollar development program, culminating in full membership in the New England Association of Schools and Colleges.

In recent years, the college has grown steadily and now offers three degrees and 19 undergraduate and graduate academic majors:

### Associate in Science

- Small Vessel Operations
- Ship Design<sup>1</sup>
- Ship Production<sup>1</sup>
- Small Craft Design<sup>2</sup>
- Small Vessel Systems<sup>2</sup>

<sup>1</sup> available only to employees of General Dynamics Corporation's Bath Iron Works Shipyard in Bath, Maine.

<sup>2</sup> joint degree program with The Landing School of Boatbuilding and Design in Kennebunkport, Maine

### Bachelor of Science

- Interdisciplinary Studies
- International Business and Logistics
- Marine Biology
- Marine Engineering Operations<sup>3</sup>
- Marine Engineering Technology<sup>3</sup>
- Marine Systems Engineering (Non-License Track)<sup>4</sup>
- Marine Systems Engineering (License Track)<sup>3</sup>
- Marine Transportation Operations<sup>3</sup>

- Marine Science
- Power Engineering Operations
- Power Engineering Technology
- Small Vessel Operations

<sup>3</sup> These majors may lead to a U.S. Coast Guard unlimited license and require participation in the Regiment of Midshipmen. See the catalog section entitled [Student Life](#) for information on the Regiment.

<sup>4</sup> This major requires first year students to participate in the Regiment and the first-year cruise.

#### Master of Science

- Global Supply Chain Logistics
- Maritime Management

## The Campus

MAINE MARITIME ACADEMY's 35-acre, 17-building campus occupies the tip of a peninsula at the head of majestic Penobscot Bay, close to [Acadia National Park](#), Deer Isle, and other notable Maine attractions.

Settled in 1613 and named for the French nobleman and trader, Baron de St. Castin, [Castine](#) is rich in history, natural beauty, and maritime tradition. Castine is a small coastal village of 7.9 square miles, yet it is only 38 miles south of Bangor, the state's third largest city and the site of an [international airport](#). The year-round population of Castine of roughly 1,300 includes 850 college students attending Maine Maritime Academy. With summer residents, and visitors by land and sea, the population at least doubles from Memorial Day to Labor Day.

Specialized laboratories -- including state-of-the-art simulators -- bring lessons of the classroom to life. Advanced teaching facilities include research vessels, marine science labs, power plant and navigation simulators, a 1,200 hp diesel engine, a liquid cargo system simulator, wet lab, multi-media lecture halls, and classrooms with wireless access for laptop computing.

There is no substitute for the practical experience students gain in cooperative education programs. Whether at the helm or in the engine room of the Academy's 500-foot training ship [State of Maine](#), in laboratory or industrial settings, students experience the world of work as part of the MMA program. Each spring the training vessel sails on a two-month cruise to domestic and foreign ports, as first- and third-year students enrolled in unlimited U.S. Coast Guard license programs apply what they have learned on campus. Sophomores are assigned to merchant ships in the Cadet Shipping Program for a minimum of 60 days for engine students and 90 days for deck students. Students in other majors also benefit from summer co-op experiences in Maine and other states, and from science and technical internships aboard research vessels and on land.

The college fleet of nearly 60 vessels also includes the tug [Pentagoet](#) used in the only on-campus tug and barge program in the nation. The research vessel [Friendship](#), equipped with side-scan sonar, a remotely operated vehicle, and a wide array of modern oceanographic instrumentation, serves the Marine Science program. The schooner [Bowdoin](#), a National Historic Landmark and Maine's Official Sailing Vessel, has taken MMA students on voyages as far north as Labrador and Greenland. Dozens of small sailboats, including Lasers, Mercuries, and 420s, for racing or recreational use, fill the Academy waterfront.

[Nutting Memorial Library](#) holds more than 72,000 titles and 2,200 videocassettes, DVDs and sound recordings. The library, in Platz Hall, subscribes to more than 325 domestic and international periodicals, and has access to thousands more online. It also serves as a selective depository for U.S. government documents and for charts and maps of the National Ocean Survey and the National Geospatial Intelligence Agency.

The Harold Alfond Student Center houses dining facilities and dining services and conferences offices, Dean of Student Services, and public affairs offices, conference rooms, graduate and undergraduate classrooms, the Waypoint Snack Bar, the campus post office, a multi-media lecture hall, and the Writing Center.

Dismukes Hall houses the Registrar, classrooms, the Kennaday Planetarium, and laboratories for science, writing, and mathematics.

Leavitt Hall houses administrative and faculty offices, network services offices, the continuing education department, Delano Auditorium, conference rooms, and guest rooms.

Capt. Quick Alumni Hall contains the alumni affairs, career services, and cooperative education offices.

Pilot House is the center for the Loeb-Sullivan School of International Business and Logistics and its administration.

Margaret Chase Smith Building houses a gymnasium, locker rooms, and offices for coaches.

Oakey Logan Alexander Physical Education Center contains a fieldhouse with basketball, tennis, and volleyball courts, a climbing wall, the Cary W. Bok Swimming Pool, racquetball and handball courts, fitness and weight training equipment, the facilities and purchasing office, and workshops.

Harold Alfond Athletic Complex consists of athletic and recreational facilities, including Ritchie Field with its all-weather in-filled synthetic turf.

The Bath Iron Works Center for Advanced Technology contains a navigation and shiphandling simulator, CAD lab and

power plant simulator, small-scale operating steam plant, an electrical power lab, and a multi-media lecture hall for humanities instruction.

Rodgers Hall houses classrooms, the machine shop, and engineering laboratories, as well as classrooms and laboratories serving the Corning School of Ocean Studies.

Andrews Hall features a flow through seawater system and aquaria for biological research, and engineering and marine transportation lab space.

Payson Hall includes classrooms, engineering laboratories, and boat repair and maintenance facilities.

The Robert S. Walker Admissions and Financial Aid Center contains the admissions and financial aid offices.

The Commons provides apartments for upper level undergraduate students.

Curtis Residence Hall is the major residential complex on campus and includes a bookstore, security offices, residential life office, Commandant's offices, student health services, student lounge and recreational area, and student government and activities offices.

Dirigo House provides offices for the Corning School of Ocean Studies and other faculty.

## Student Life

MAINE MARITIME ACADEMY is committed to the belief that learning takes place both in and out of the classroom. Accordingly, the college is structured to maximize the potential for such learning.

Maine Maritime Academy has an average student population on its Castine campus of 850 full-time undergraduate students and 10 – 15 graduate students in residence. In addition to these students, approximately 100 students are enrolled in the A.S. degree program at Bath Iron Works.

A special feature of student life at Maine Maritime is the mix of students who live a traditional college lifestyle and those who participate in the Regiment of Midshipmen. Although students who become midshipmen wear military-style uniforms, Maine Maritime is not a military academy, and there is no military obligation after graduation. Traditional and regimented students live in the same residence hall, attend many of the same classes, and are eligible to participate in all campus clubs, activities, and athletics.

Students often participate in the [Castine](#) community. MMA students have opportunities to volunteer for the local fire department, rescue squad, Big Brothers, Big Sisters, the Adams (Elementary) School, and daycare. The local churches, clubs, and historical society welcome students and provide an opportunity to become a part of a small but vibrant community. Bangor and Ellsworth, both about 55 minutes away by automobile, are the closest cities. [Acadia National Park](#) is just over an hour's drive away, and ski areas are two hours distant.

### The Regiment of Midshipmen

All candidates for a U.S. Coast Guard unlimited license as a Third Mate or Third Assistant Engineer are required to be members of the Regiment of Midshipmen. The majors leading to an unlimited license, and thus requiring regimental participation, are Marine Transportation Operations, Marine Systems Engineering (License Track), Marine Engineering Technology, and Marine Engineering Operations. Marine Systems Engineering (Non-License Track) requires first-year students to participate in the Regiment, including the first-year cruise. For all other majors, membership in the Regiment is an optional but valuable experience that can help students to build job-related skills regardless of career path.

Although modeled after Navy and Coast Guard traditions, the purpose of the Regiment is not to produce military officers, but to provide leadership and management training for students desiring careers in the U.S. Merchant Marine and in science, engineering, and business. The Regiment does this by providing a structured training environment where students develop time management skills and self-confidence, enhance their personal value system, and are instilled with the Regiment's core values of honor, loyalty, and devotion to duty. Applicants for a U.S. Coast Guard unlimited license must meet the requirements governing physical condition, citizenship, and prior preparation, as outlined in the [Admissions](#) section.

The Regiment is a leadership program with a disciplined lifestyle designed to positively affect all aspects of a student's life at Maine Maritime Academy. Members wear military style uniforms, learn professional courtesies, and become familiar with shipboard life within a few days of reporting for first-year orientation. This rigorous lifestyle is challenging and rewarding; in particular, while learning how to follow in order to better lead, the student makes new lifelong friends. Over the four years, midshipmen are given more and more responsibility until, as seniors, they become the regimental leadership.

During the academic year, studies receive first priority. Midshipmen have ample time for personal study and research, as well as time to engage in recreational activities, such as [varsity sports](#), after class. Weekends are usually free, unless the student is assigned to a watch or a maintenance responsibility aboard the training ship. Immediately following the first- and third-year spring terms, midshipmen in the license programs participate in a 60-day [training cruise](#)\* aboard the training ship, [State of Maine](#). These are exciting times as the students cruise the Caribbean or European waters, making several ports of call while receiving hands-on training in all aspects of ship operation. During the summer following the sophomore year, midshipmen in these programs are assigned to [merchant vessels as cadets](#)\* to further familiarize them with shipboard procedures.

\*Students not in good academic standing (Academic Probation or Warning status) may be required to delay their assignments to the freshmen or junior cruises aboard the *T.S. State of Maine*, or as cadets aboard merchant vessels, until they are in good academic standing.

### Extracurricular Activities

Many campus events take place throughout the year, including films, lectures, concerts, and plays, providing a full range of cultural involvement for the entire community. More than 30 organizations operate on campus, under the jurisdiction of Student

Government. Some of these groups include:

- Activities and Bands Committee (ABC)
- Alpha Phi Omega (co-ed community service fraternity)
- American Society of Mechanical Engineers (ASME)
- Band
- Drama Club
- Drill Team
- Outdoor Adventure Club
- Propeller Club of the United States
- Rugby Club
- Schooner Crew
- Society of Naval Architects and Marine Engineers (SNAME)
- Student Environmental Activists (SEA)
- Students in Free Enterprise (SIFE)
- Students Living in Christ Everyday (SLICE)
- Weightlifting Club

### Student Housing

MMA has a residency requirement. All undergraduate students at MMA are required to live on campus with certain exceptions. Students who are married, have lived on campus for six semesters or more, are 22 years of age or older by the end of the corresponding calendar year, or are military veterans with two years of service and an honorable discharge, are eligible to apply to live off campus. Exceptions to this residential policy require the approval of the Dean of Student Services. Housing in and around Castine is limited.

Students provide their own telephone, computer, pillows, towels, and linen. Card-operated washers and dryers are available on each floor of the Curtis Hall residence complex. Residents are expected to have their own insurance (see section on Personal Property). Deductions from a deposit are made for damages beyond normal wear and tear, if deemed appropriate. See the catalog section entitled "[Affording MMA](#)" for more information regarding security deposits.

Non-degree students are not normally eligible to live on-campus unless enrolled in at least twelve credit hours of study.

### Student Health

Student Health Services on the MMA campus is located in Curtis Hall (207-326-2295, or ext. 295). A registered nurse is on campus Monday through Friday from 7:00 a.m. to 3:00 p.m. The Academy physician is available to see students between 6:45 a.m. and 7:45 a.m. from Monday to Friday. There is no fee for students to see the doctor or the nurse in Health Services. A fee may be charged to the student account for some supplies and medications that are provided to the student. After hours and on weekends, emergency care can be initiated by calling the MMA Security Office (207-326-2479, or ext. 479). Ambulance service is available and healthcare providers are located in emergency rooms in local hospitals. During the training cruise, a physician and nurse are aboard the ship.

All students are required to show proof of medical insurance coverage upon admission to the college, and each subsequent fall. Students must maintain insurance coverage throughout their stay at MMA and are responsible for informing the college of any changes in coverage. Students who are not covered by family medical insurance will be required to purchase the Academy's medical insurance (see section on [Affording MMA](#)).

Maine Maritime Academy requires that all students be immunized in accordance with 20-A MRSA Chapt. 223 Sub. Chapt. 2 § 6359. This Maine law states that any person born after 1956 who attends school full time or who is a candidate for a degree, diploma, or graduate certificate must be immunized against the following diseases:

- Diphtheria/pertussis/tetanus (five doses)
- Adult tetanus/diphtheria booster within the last ten years
- Measles, mumps, rubella (MMR), 2 doses, one after 12 months of age and a second dose at least 1 month later
- Poliomyelitis (4 doses of OPV with the first one being six weeks after birth or 4 doses of IPV administered the same.)
- Varicella (chicken pox), 1 dose for all children entering kindergarten or documented history of the disease.

In addition to the above State requirements, Maine Maritime Academy also requires entering students to have proof of the following immunizations and tests:

- Hepatitis A (one shot with a booster in six months)
- Hepatitis B (one shot with a booster in one month and a second booster in five months)
- Meningitis
- Mantoux test for tuberculosis (PPD) within the last year

Students may also provide copies of laboratory evidence of immunity (titers) to satisfy their immunization requirements for MMR, Hep A, Hep B and varicella. A student is exempt from immunizations if he/she has documentation from a physician that immunization against one or more diseases is medically inadvisable, or the student/guardian states in writing an opposition to immunization because of a sincere religious belief or philosophical reason. Students who choose one of these exemptions and do not provide proof of immunity will be excluded from taking classes or participating in activities during the danger period (15-23 days) if an outbreak of one of the above infectious diseases occurs.

To demonstrate adequate immunization against each disease, a student must present a certificate of immunization from the physician, nurse, public health official, or school provider who administered the immunization. The proof must specify the immunizing agent and the date it was administered. School health records are usually accepted to meet these requirements. A letter from a doctor is not acceptable. If immunization cannot be determined, re-immunization is required.

Before a student can register at MMA, he or she must have a physical exam on file on MMA's physical exam form. The student's personal healthcare provider can perform the exam.

The Academy Counselor (207-326-2419, or ext. 419) provides professional personal counseling for students and serves as the Substance Abuse Prevention Education Coordinator. Prevention Education involves teaching students healthy lifestyle skills with the aim that these skills become habits. Other topics covered include personal responsibility, legal consequences, and social awareness. Services of the Academy Counselor are provided free of charge to students.

### Disabled Students

Special facilities and services available to students with disabilities are limited. The campus is not barrier free. Nevertheless, the Academy seeks to comply with relevant provisions of Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and the ADA Amendments Act of 2008. Students who have concerns regarding accommodations should contact the Office of the Associate Academic Dean. Individuals who are not MMA students should contact the Office of the Director of Human Resources Management with concerns regarding this legislation.

### Orientation and Regimental Training Program

Prior to the start of classes, all new students to MMA are required to attend an orientation session, a program designed to familiarize students with the facilities, programs, and organization of the college and to ease the transition into college life. For members of the Regiment the program includes a period of training in the traditions of the Academy, as a preparation for the rigorous life of a midshipman.

## Student Affairs Policies

### Confidentiality of Students Records

Upon written request, students, former students, and graduates are authorized access to records of their attendance, performance, and scholastic achievement. This policy is in keeping with the Family Educational Rights and Privacy Act of 1974 as amended. The regulations are available to interested persons upon request to the Registrar and, as an official part of Academy rules and regulations, are disseminated to all students in the Student Handbook. Any individual whose rights have been infringed upon may appeal to the President of the Academy or directly to the Secretary of Education, Washington, D.C.

### Transcripts

Transcripts of student records may be obtained from the Registrar at a cost. Persons with outstanding financial obligations will not be provided copies of Academy records until such obligations are met.

### Release of Information

Unless specifically requested in writing not to do so, the Academy reserves the right to publish directory information as defined by the Family Educational Rights and Privacy Act of 1974 as amended. Such information, relating to students and student activities at Maine Maritime, includes a student's name, address, date and place of birth, participation in athletics or other student activities, class schedule, degrees, awards, and other similar information.

### Vacations

Vacations are usually scheduled around Thanksgiving, Christmas, early March, and during the summer. Midshipmen receiving federal incentive payments should be aware that federal regulations specify limits on medical leave, leaves of absence, and vacations in order to continue to receive such payment. Current regulations are available at the Academy. Our residence hall and dining facilities close over academic year breaks.

### Uniforms

Upon entering MMA, all regimental students are required to purchase uniforms (normally at the bookstore) to be worn only as authorized by the Commandant of Midshipmen. Uniforms and equipment become the property of the student and may not be returned to the Academy. Non-regimental students are not subject to a uniform requirement.

### Personal Property

The Academy cannot assume responsibility for loss or damage to personal property through fire, theft, or other causes. Persons desiring such protection should purchase an appropriate insurance policy.

### Automobiles

Due to the nature of the campus, and the limited parking available, all students, staff, and faculty are encouraged to walk to and from class and other activities. Upper-class students or those living off-campus may bring automobiles to the Academy for use only when traveling to and from the campus. All vehicles parked on Academy property must be registered at the Security Office in Curtis Hall and have a parking sticker. There is a charge for Sophomore and Junior/Senior parking permits (on campus students only). These permits are limited in number. If a student with this type of permit is unable to find a space in the designated lot, he/she must contact the Security Office, for permission to park elsewhere. Commuter permits (students only) are free and are not limited in number. Alternative on-campus parking is not available for students with valid computer permits who are unable to find a parking space. In order to be registered on campus, all vehicles must be insured for third person liability. First year students should not bring automobiles to campus. Should a vehicle be a necessity, limited remote (off-campus) parking is available.

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## Athletics

The [Varsity Athletic Program](#) offers the highly-skilled and competitive student-athlete an opportunity to excel in a chosen sport. The Academy sponsors intercollegiate competition in men's and women's sailing, cross country, basketball, and soccer; men's football, lacrosse, and golf; women's softball and volleyball.

MMA teams function under the rules of the National Collegiate Athletic Association (NCAA) Division III. Teams play in the New England Football Conference, and the North Atlantic Conference.

Club sports are available for students interested in informal competition against other colleges. Club teams include racquetball, ice hockey, skiing, indoor soccer, outing club, paintball, rugby, sail training.

The intramural program organized by and for the student body, includes basketball, volleyball, racquetball, and softball.

## Career Services

[Career Services](#) is located in Captain Quick Alumni Hall. Career Services staff members work with undergraduate students, graduating seniors, alumni, business and industry professionals, and the college administration and faculty. Based on a high continuing success rate of graduating seniors finding jobs related to their field of study, Maine Maritime Academy has been very successful in its mission.

Career Services staff members assist students in obtaining co-op and full-time employment. Co-op often leads to full-time employment by helping the student gain experience, making companies aware of our college, and giving a company a "risk-free" way of evaluating a potential employee.

Beginning with the second semester of their first year, students are encouraged to attend employer presentations and to begin to get acquainted with companies and industries. The Nutting Memorial Library maintains a periodical reading room with many industry-specific magazines and newspapers. Career Services maintains the E. Joseph Farr Resource Room to help students find more information about specific companies and industry trends. Students are encouraged to begin to develop professional network contacts in the industry in which they plan to work, through alumni, key personnel and faculty and staff. There is a wealth of current information available through these contacts.

Career Services assists students and alumni by:

- Sponsoring employer presentations and coordinating employer interviews for seniors and co-op students
- Maintaining a current job listing on the Internet
- Publishing handbooks to guide students through the practical experience and job hunting part of their education
- Conducting cadet shipping and co-op workshops
- Proof reading resumes and cover letters
- Coordinating cadet shipping and co-op documentation and projects
- Contacting and visiting companies on a regular basis to stay abreast of company and industry changes and the available jobs
- Conducting resume and job hunting strategy workshops
- Coordinating the practical experience side of education between the faculty, employer, and student

## Library Services

The Nutting Memorial Library is located in Platz Hall and part of adjoining Quick Hall. Its holdings include approximately 72,000 titles and 2,200 videocassettes, DVDs, and sound recordings. The library subscribes to more than 325 domestic and international periodicals in print and online, and has extensive retrospective serial holdings. The collections are particularly strong in the areas of maritime studies, marine technology, international business, and nautical history. Students and faculty also have online access to thousands of other full-text journals, and to a statewide library catalog of more than 2.5 million books, which may be borrowed through interlibrary loan.

The library serves as a selective U.S. government documents depository, emphasizing maritime, engineering, oceanographic, and business publications. Links to online government information are found on the library's web site. As a depository for the National Geospatial Intelligence Agency and the National Ocean Survey, the library houses nearly 5,000 maps and charts of the world and of the territorial waters of the U.S.

The library's web site <http://library.mma.edu/> serves as a gateway to library holdings and to online databases and internet resources by category. There are fifteen computer workstations, a networked laser printer and a scanner; wireless network access is available as well. All PCs have basic MS Office software installed for student use.

Nutting Memorial Library provides numerous online and CD periodical indexes and databases, as well as their older print versions.

Books or journal articles not found in the library or online may be obtained from other institutions through Interlibrary Loan. Delivery of books or articles via ILL is free of charge and generally takes 5-10 days, unless the material may be faxed.

Group study and quiet areas are available within the library, with ample seating at tables and individual study carrels on all three floors. Two spacious reading rooms offer commanding views of the campus, while the current periodicals area overlooks Penobscot Bay. There is also a 24-hour study lounge for student use.

The library continues to respond to Academy changes and student needs, and welcomes suggestions from its users for additions to the resources and services it provides. For more details see the Nutting Memorial Library homepage at: <http://library.mma.edu/>.

## Naval Service Commissioning Programs

### Naval Reserve Officers Training Corps

The Naval Reserve Officers Training Corps (NROTC) program is designed to train and educate highly qualified students for commissioning and active service as unrestricted line officers in the U.S. Navy and the U.S. Marine Corps. To be eligible for this program, a student must:

1. Be a U.S. citizen
2. Be at least 17, but less than 27 years of age at graduation
3. Be physically qualified
4. Possess satisfactory records of academic ability and moral integrity
5. Demonstrate those characteristics desired of a Naval Officer
6. Have no moral reservation or personal convictions that prevents the bearing of arms

The NROTC Scholarship Program offers the following benefits: all tuition and fees paid, a book allowance (\$375 per semester), a uniform allowance, and a per month subsistence allowance during the school year, (Freshman: \$250; Sophomore: \$300; Junior: \$350; Senior: \$400). Additionally, National Scholarship winners who attend Maine Maritime Academy are provided free room and board or a stipend of \$1,000 per semester in lieu of room and board if not residing in the campus dormitory. Scholarship Program graduates receive commissions in the Navy or Marine Corps and are required to serve on active duty for a minimum of four years. High school students may apply for the NROTC National Scholarship Program anytime between the spring semester of their junior year and the fall semester of their senior year. Because the total number of scholarships given varies each academic year, early application is strongly recommended for this highly competitive program.

The NROTC College Program offers students who are not on scholarship the opportunity to participate in the NROTC and earn their commission as a Naval or Marine Corps Officer. Benefits include a uniform allowance, \$350 per month subsistence allowance during the junior year, and \$400 per month subsistence allowance during the senior year. Graduates of the NROTC College Program receive commissions and are required to serve on active duty for a minimum of three years. Students may apply for the NROTC College Program anytime during their first year through the end of their sophomore year.

Scholarships are also available to qualified students who join the NROTC unit after they arrive on campus. The NROTC Unit Professor of Naval Science makes nominations for these scholarships after a student has been in the NROTC College Program for at least one semester. Selection is based on academic performance, aptitude for Naval service, and the recommendation of the Professor of Naval Science.

For more information about the NROTC National Scholarship or College Programs, contact your local Navy Recruiting Office. Further information on NROTC programs and application forms can also be obtained at <https://www.nrotc.navy.mil> or by calling 1-800-NAV-ROTC.

For information about the NROTC Program at Maine Maritime Academy, contact Commanding Officer, NROTC Unit, Maine Maritime Academy, P.O. Box 137, Castine, ME 04421-0137, (207) 326-2352, or email [donald.probert@mma.edu](mailto:donald.probert@mma.edu). Also, visit the MMA NROTC home page at <http://nrotc.mma.edu>.

### Merchant Marine Reserve

The Merchant Marine Reserve (MMR) Program is designed to train and educate highly qualified students for commissioning and reserve duty service as officers in the Merchant Marine Reserve component of the U.S. Navy Reserve (USNR). To be eligible for this program, a student must:

1. Be a U.S. citizen
2. Be at least 17, but less than 25 years of age (upon enrollment at MMA)
3. Be physically qualified
4. Possess satisfactory records of academic ability and moral integrity
5. Demonstrate those characteristics desired of a Naval Officer
6. Have no moral reservation or personal conviction that prevents the bearing of arms
7. Be enrolled in a Bachelor of Science Degree Program leading to a U.S. Coast Guard Unlimited License

Students who meet the qualifications above may apply for Midshipman status in the MMR Program and participate in the U.S. Maritime Administration's Student Incentive Payment (SIP) Program. If selected, an incentive payment of \$8000 per academic year

is provided for up to a maximum of four years. The SIP Program requires students to obtain a Coast Guard Unlimited License and to apply for, and accept if offered, a Reserve officer commission in the U.S. Armed Forces. A student who receives SIP incurs an obligation to serve as an employee in the maritime or maritime-related industry, and in times of national emergency, to serve as a Naval Officer aboard a U.S.-flagged vessel.

The MMR, USNR, and SIP application, selection and program requirements are as follows:

1. Apply for the SIP Program and Midshipman status in the U.S. Navy Reserve
2. Complete a physical examination to verify eligibility (at DOD expense)
3. Students must agree in writing to apply for, and accept if offered, a Reserve officer's commission
4. The application process takes up to two months and must be complete prior to the beginning of the academic year in order to be eligible for SIP during the Freshman year
5. Continuation in the program is based on continued eligibility (i.e. Minimum GPA 2.0 with satisfactory participation in program)

First year

1. Participate in weekly Naval Science lab
2. Pass Navy physical fitness assessment and swim qualification

Sophomore year

1. Participate in weekly Naval Science lab
2. Complete NV212 (Naval Science for the Merchant Marine Reservist I)
3. Pass Navy physical fitness assessment and swim qualification

Junior year

1. Complete NV222 (Naval Science for the Merchant Marine Officer)
2. Participate in weekly Naval Science lab
3. Pass Navy physical fitness assessment and swim qualification

Senior year

1. Complete all processing and apply for a commission
2. Pass the U.S. Coast Guard Unlimited License examination
3. Complete NV402 (Leadership and Ethics) and NV442 (Naval Science for the Merchant Marine Reservist II)
4. Participate in weekly Naval Science lab
5. Pass Navy physical fitness assessment and swim qualification
6. Be commissioned at graduation as an Ensign in the U.S. Merchant Marine Reserve, USNR

After graduation/commissioning (minimum obligation)

1. Complete a minimum of two weeks of active duty each year for a total of six years
2. Sail on one's Coast Guard License for at least four months every two years, or be employed in a maritime-related job\*, for a total of six years
3. Remain in the Inactive Reserve (with no other obligations) for an additional two years

\*The U.S. Maritime Administration believes that employment in a shore-based power plant is substantially related to the marine engineering profession and therefore qualifies as acceptable employment to satisfy one's minimum obligation.

For information about the MMR, USNR, and SIP Programs at Maine Maritime Academy, contact Commanding Officer, NROTC Unit, Maine Maritime Academy, P.O. Box 137, Castine, ME 04421-0137, (207) 326-2352, or email [donald.probert@mma.edu](mailto:donald.probert@mma.edu).

For more information about the Merchant Marine Reserve, U.S. Navy Reserve Program, contact the MMR Program Office at Naval Reserve Forces Command, MMR Program Office, 4400 Dauphine St., New Orleans, LA 70146-5100, 1-800-535-2580.

## Admissions

MAINE MARITIME ACADEMY seeks academically qualified and motivated students interested in earning a bachelor's degree in Marine Engineering Operations, Marine Engineering Technology, Marine Systems Engineering, Marine Transportation, Small Vessel Operations, Power Engineering Operations, Power Engineering Technology, Marine Science, Marine Biology, International Business and Logistics, Interdisciplinary Studies; or an associate's degree in Small Craft Design, Small Vessel Systems, or Small Vessel Operations. Applicants shall demonstrate ability and potential through their academic transcripts, extracurricular activities or work recommendations, and standardized tests.

The Academy offers Early Decision on admission and financial aid for applicants who have completed the application process by December 20. This applies only to students entering in the fall semester. Early Decision candidates must sign a statement indicating that MMA is the only college to which they are applying for Early Decision, and that if accepted, they will enroll.

All other applications are reviewed by the Admissions Committee beginning in the late fall. Admissions decisions are made on a rolling basis. Applicants are encouraged to apply as early as possible, as the entering class may be filled prior to the application deadline of May 30.

Applications may be obtained from the Director of Admissions, Maine Maritime Academy, Castine, ME 04420-5000, by calling 1-800-464-6565 in Maine or 1-800-227-8465 out-of-state or by e-mail at [admissions@mma.edu](mailto:admissions@mma.edu). Visit the Admissions site at [www.mainemaritime.edu](http://www.mainemaritime.edu) to download an application or apply on-line. A non-refundable fee of \$15 is required when the application is mailed.

As early as possible after an application has been made, the following items must be forwarded to the Director of Admissions:

1. A secondary school transcript through the first marking period of the senior year.
2. A letter of recommendation from the principal or guidance counselor of the last secondary school attended.
3. Results of either the College Entrance Examination Board Scholastic Aptitude Test (SAT) or the American College Testing Program (ACT). Applicants taking the SAT or ACT after Fall 2004 are required to take the Writing portion of the respective exam. Prospective students who took the SAT or ACT prior to Spring 2005 are exempt from this requirement. These exams should be taken as early as possible in the senior year.

Minimum academic requirements for undergraduate admissions consideration include:

	English & Composition	College Prep Algebra I & II	College Prep Geometry	College Prep Senior Math*	Lab Biology, Chemistry, Physics	Foreign Language	Computer Science
International Business & Logistics	4	2	1	1	2	2 desired	1 desired
Interdisciplinary Studies	4	2	1	1	2	2 desired	1 desired
Marine Biology	4	2	1	1	2	2 desired	1 desired
Marine Engineering Operations	4	2	1	1	2		1 desired
Marine Engineering Technology	4	2	1	1	2 (Physics preferred)	2 desired	1 desired
Marine Science	4	2	1	1	2	2 desired	1 desired
Marine Systems Engineering	4	2	1	1**	2 (Physics preferred)	2 desired	1 desired
Marine Transportation Operations	4	2	1	1	2	2 desired	1 desired
Power Engineering Operations	4	2	1	1	2		1 desired
Power Engineering Technology	4	2	1	1	2 (Physics preferred)	2 desired	1 desired
Small Craft Design	4	2	1	1	2		1 desired

Small Vessel Systems	4	2	1	1	2		1 desired
Small Vessel Operation	4	2	1	1	2		1 desired

\* Senior Math - trigonometry, advanced math, pre-calculus, or calculus.

\*\* Marine Systems Engineering requires pre-calculus or calculus.

A prospective student is encouraged to apply even if he/she is missing one or more of the courses above, or didn't perform well in them academically. Contact the Admissions Office to discuss plans to acquire the necessary course(s). To meet admissions requirements, many MMA students (and graduates) have successfully completed the course(s) prior to enrollment through community colleges, adult education programs, tutorials, and/or correspondence courses. These provisional acceptances account for 15-20% of MMA's incoming classes.

### Offer of Admission

All offers of admissions are extended with the understanding that records of academic achievement and personal conduct will remain at least at the same level as when the application for admission was reviewed. Maine Maritime Academy reserves the right to rescind any offer of admission if it is determined that subsequent academic performance and/or personal behavior are deemed substandard or unacceptable.

### Fraudulent Reporting

Applicants must provide accurate and complete information on all application documents. Intentional omission or falsification of information during the application process will result in the immediate rejection of the application. Application misrepresentation includes, but is not limited to: (1) false, omitted, or misleading information on the application, medical or immunization forms, financial aid disclosures, or during the personal interview, (2) fake, forged, or altered transcripts, standardized test scores, or letters of recommendation.

### Interview

A personal interview is highly recommended as part of the admissions process. The absence of an interview may, in fact, be a determining factor in the final decision. Admissions Office personnel are available by appointment for interviews and college tours Monday through Friday, from 9 a.m. to 4 p.m. Maine Maritime Academy reserves the right to solicit confidential opinions from secondary school officials concerning a student's potential for success at MMA, both in the classroom and in our unique social environment.

Interviews may be scheduled at various locations throughout the northeast during late fall and early winter, depending on the Admissions representative's travel schedule. Phone interviews are available, as well.

### Visiting

Appointments to visit the college should be scheduled well in advance. With prior notice, the Admissions Office will provide on-campus overnight accommodations without charge for the applicant and his or her family. Call for further details.

[Open houses](#) are also scheduled at the Academy during the academic year. Information regarding these events may be obtained from the Academy's home page <http://www.mainemaritime.edu> or through the [Admissions Office](#).

### Transfer Students

Transfer students will be considered for advanced standing on the quality of their credentials. Applicants must present an official transcript of work completed at accredited colleges or universities; only courses with grades of C or better will be considered for transfer. The amount of transfer credit awarded will depend on the application of the courses to MMA's curriculum and will be evaluated by the Admissions and Registrar's Offices.

Applicants for transfer should submit the following: an application for admission, a letter indicating interest in transfer, a non-refundable \$15 application fee, a certified transcript of all grades received at institutions of higher education, a letter of recommendation from the dean of students of the last institution attended, and a complete record of secondary school work, including the most recent SAT or ACT scores. Maine Maritime Academy reserves the right to solicit confidential opinions from school officials concerning a student's potential for success at MMA, both in the classroom and in our unique social environment.

Please note that it is usually not possible to satisfy the unique academic requirements of the bachelor of science program in less than three years at Maine Maritime Academy. Transfer students are urged to have an interview with the Director of Admissions. Visits or telephone interviews should be planned for weekdays.

Because of scheduling and prerequisite requirements, Maine Maritime Academy cannot guarantee transfer students that all courses will be available in the sequence desired for graduation in an accelerated (less than 4 years) program. Every effort will be made to accommodate transfer students, but first priority in scheduling courses will be for the standard 4 year BS degree. See the [Academic Policies](#) section for Priority for Course Registration.

For more information on transferring credits, see the [Degree Requirements](#) information in the Academic Program section.

## International Applicants

In addition to completing the Maine Maritime Academy application, international students must have all non-U.S. diplomas, certificates, licenses, and transcripts evaluated by an approved clearinghouse. This clearinghouse verifies international transcripts for:

1. authenticity
2. grade and course equivalency
3. transfer credits awarded

Maine Maritime Academy recognizes the following evaluation service providers:

### [Globe Language Services, Inc.](#)

Evaluation Service

319 Broadway

New York, NY 10007

phone: (800) 446-6228

fax: (212) 693-1489

- and -

### [World Education Service](#)

Bowling Green Station

P.O. Box 5087

New York, NY 10274-5087

phone: (212) 966-6311

fax: (212) 739-6100

An application for evaluation is available through their respective on-line service. This service does require a fee. The fee varies depending on which service you choose and what type of evaluation you request. Maine Maritime Academy requests prospective international students do an undergraduate course-by-course breakdown of credits, a calculation of credit hours, and a verification of authenticity.

The Test of English as a Foreign Language (TOEFL)

[http://www.ets.org/portal/site/ets/menuitem.fab2360b1645a1de9b3a0779f1751509/?](http://www.ets.org/portal/site/ets/menuitem.fab2360b1645a1de9b3a0779f1751509/?vgnextoid=69c0197a484f4010VgnVCM10000022f95190RCRD)

[vgnextoid=69c0197a484f4010VgnVCM10000022f95190RCRD](http://www.ets.org/portal/site/ets/menuitem.fab2360b1645a1de9b3a0779f1751509/?vgnextoid=69c0197a484f4010VgnVCM10000022f95190RCRD) or International English Language Testing System (IELTS)

<http://www.ielts.org> is required of all international applicants whose native language is not English.

Minimum TOEFL score required for admissions consideration: 550 on the paper-based test (PBT), 215 on the computer-based test (CBT), or an 80 on the internet-based test (IBT).

In lieu of the TOEFL, a student may submit the IELTS. Only the academic format is acceptable and a minimum score of 6.5 is required.

The TOEFL/IELTS requirement may be waived if the applicant is currently enrolled in full-time studies in the United States and will have completed two academic years of coursework in the United States immediately prior to enrolling at Maine Maritime Academy.

The TOEFL/IELTS requirement is waived for non-native English-speaking applicants who have received an undergraduate or graduate degree from an institution where English is the language of instruction.

International applicants must certify that sufficient funding is available to cover MMA fees, books, supplies, tuition and living expenses for the entire duration of their enrollment. A letter of sponsorship or an officially certified or notarized bank statement must indicate that the candidate has sufficient funds to study at Maine Maritime Academy. Submit documentation of financial support to the Director of Admissions. Unfortunately, international students are ineligible for any form of federal financial assistance

while enrolled.

## Advanced Placement and CLEP

The college grants credit for appropriate courses through the Advanced Placement Examination of the College Entrance Examination Board. Transfer credit may also be obtained through the College Level Examination Program (CLEP).

## Certified Birth Certificates

Prior to arriving on campus, accepted candidates must submit a certified copy of their birth certificates with raised seal. This may be obtained from the town or city clerk of birthplace or from the respective state division of vital statistics.

## Social Security Number

Maine Maritime Academy is committed to ensuring the privacy and confidentiality of student records and will not disclose the Social Security Number (SSN) for any purpose without the expressed written consent of the student, except as mandated by law.

Applicants are not required to include their Social Security Number on the application for admission but voluntary submission will minimize delays associated with other requested services within our campus administration. The number is used for (1) verifying student records, (2) identifying the student for purpose of financial aid eligibility, disbursement of financial aid loans, and other debts payable to the institution, (3) compliance with state and federal reporting requirements, (4) U.S. Coast Guard licensing, (5) background checks for security sensitive co-operatives, and (6) citizenship related documents.

## Physical Examination

A physical examination is required for all applicants for admission. Medical forms are sent to the student upon receipt of an application for admission. The examination should be conducted by the applicant's family physician, and the completed medical forms returned by the physician to the Director of Admissions. These results will be reviewed initially by the College's physician. Applicants who are unable to satisfy these physical requirements may appeal to the Director of Admissions.

## Immunization

Please refer to Student Health section in the [Student Life](#) chapter.

## Personal Computing Requirement

All entering students are required to bring a [laptop computer](#). Prior to enrolling, students will be provided with information regarding the [specifications](#) for their computers and any purchase/lease plans that may be available.

## Applicants for U. S. Coast Guard License

Applicants for the U.S. Coast Guard unlimited license program as a Third Mate or Third Assistant Engineer must meet the requirements governing physical condition, citizenship, and prior preparation. These requirements cannot be waived unless special permission is obtained from the appropriate federal office or agency.

Except by special condition, applicants desiring a US Coast Guard license must meet the following requirements:

1. A student must be a high school graduate or must have earned an equivalency certificate.
2. A student must be a citizen of the United States.
3. Applicants must meet the physical requirements established by the United States Coast Guard for an unrestricted license as a ship's officer. They are as follows:
  - Height:* no limitation prescribed
  - Weight:* proportional to height and age

*Vision/Mate:* For an original license as mate, the applicant must have correctable vision to at least 20/40 in each eye, and uncorrected vision of at least 20/200 in each eye. The color sense must be determined to be satisfactory when tested by any of the following methods:

- a. Pseudoisochromatic Plates (Dvorine, 2nd edition: AOC; revised edition or AOC-ERR; Ishihara 16-, 24-, or 38- plate editions)
- b. Eldridge-Green Color Perception Lantern
- c. Farnsworth Lantern

- d. Keystone Orthoscope
- e. Keystone Telebinocular
- f. SAMCTT (School of Aviation Medicine Color Threshold Tester)
- g. Titmus Optical Vision Tester
- h. Williams Lantern

*Vision/Engineer:* For an original license as engineer, the applicant must have correctable vision of at least 20/50 in each eye and uncorrected vision of at least 20/200 in each eye. Applicants need only to have the ability to distinguish the colors red, green, blue, and yellow. A waiver will be required for those students seeking a USCG license whose vision is between 20/200 and 20/800. Questions concerning the waiver process should be directed to the Academy's Director of Health Services at (207-326-2295, or ext. 295).

*General Health:* Applicants for the license programs must be free of any disease or constitutional defect that would compromise shipboard safety while at sea. Contact the Academy's [Student Health Services Office](#) for clarification of specific disorders that may disqualify a student from a license program.

Applicants who applied for an NROTC scholarship or for admission to a service academy may request the Department of Defense Medical Review Board to forward a copy of their complete physical examination report to Maine Maritime Academy. The student should advise the Maine Maritime Academy Admissions Office that a physical report will be forwarded. In rare cases, candidates accepted for NROTC scholarships may not be fully qualified for the maritime license program.

An applicant accepted into a USCG license program will be required to complete another physical examination on campus during his/her senior year prior to taking the USCG exam. Should this subsequent examination show physical deficiencies below the standards established for a license, the student may not be allowed to sit for the exam and may be required to change his or her major to a non-license program.

### Drug Testing

All students enrolled in undergraduate degree programs at Maine Maritime Academy are required to participate in the random drug testing program. Maine Maritime Academy complies with Title 46 Code of Federal Regulations 16.230 mandating periodic, random, pre-employment, post-incident, and reasonable cause drug testing for all students and employees whose position require this testing. All students and employees, who act as part of the crew of any Academy vessel, both documented and undocumented, shall be subject to the policy. Federal law requires periodic or random drug testing of students prior to training cruises, cadet shipping, or taking of a US Coast Guard physical examination. Additionally, since drug testing and "zero-tolerance" policies have become a fact of life in the industries in which most of our students will be working, as co-op students and as employees, it is the Academy's policy that any student pursuing an Academy Cooperative Education Experience (COOP) must participate in the random and pre-employment drug testing program. Additionally, any students who are in a disciplinary status for any violation of our drug or drug testing policies may be subject to increased random drug testing.

### Readmission Policy

All former students who have resigned, been disenrolled, or not been enrolled for two consecutive academic semesters, and who wish to apply for readmission, must submit an application for readmission and a non-refundable \$15 fee to the Director of Admissions. The application will be considered by the Academic Board sitting as a Board of Readmission. An application for readmission can be found at [www.admissions.mainemaritime.edu](http://www.admissions.mainemaritime.edu).

Favorable consideration will be based upon evaluation of the reasons for previous separation, evidence of improved academic standing, improved conduct, and increased personal maturity. Admissions authorized by the Academic Board will be subject to space being available in the class and program for which admission is sought.

Students may be readmitted to the Academy at the start of the fall semester, the spring semester, annual training cruise, cadet shipping, or co-operative. An application for readmission must be completed by the following dates for consideration:

- Fall semester - July 1
- Spring semester - October 15
- Training cruise - March 1

The application must be accompanied by such additional information as required by the Director of Admissions to establish justification for favorable consideration. Applying for readmission requires:

1. a completed application for readmission and \$15 fee prior to the deadlines stated above;
2. a typed resume to include a description of what you have done during your absence.  
Include: employment, schools attended, courses taken, and a statement for why you wish to return to MMA;

3. two (2) letters of recommendation from MMA faculty members and/or administrators;
4. a letter of recommendation from a recent employer;
5. an official transcript from each school attended since last enrolled at MMA;
6. written proof from the MMA chief financial officer stating that you are in satisfactory financial standing with the college.

*Students seeking readmission will be required to personally appear before the Readmission Board at the time applications are reviewed. Once your application is complete, the Director of Admissions will contact you with specific arrangements concerning your interview with the board.*

MMA will try to meet the returning students course selection requests. However, pre-registration by currently enrolled students may result in desired courses being at capacity. See the [Academic Policies](#) section for Priority for Course Registration.

- NOTE: All students must submit an updated physical examination as a criterion for readmission. Depending on how long you have been out of school, you may be required to have additional immunizations. Should you have additional questions regarding your immunizations, contact the Director of Health Services at 207-326-2295 or by e-mail at [susan.mcdonald@mma.edu](mailto:susan.mcdonald@mma.edu). You must satisfy all physical and immunization requirements prior to registration.

A \$100 deposit is required of all returning students to reserve their position in the class. Failure to notify the Director of Admissions by the appropriate date may result in loss of place.

In cases of a negative decision, applicants may submit a written appeal to the President within ten days of notification. The request should stipulate the basis for appeal.

Students who resign from the Marine Maritime Academy/Bath Iron Works Associate Degree programs may apply for readmittance to the program only by contacting the Director of Admissions at Maine Maritime Academy. The application must include a supporting endorsement from the Industry Site Director. A student who has continued to take Academy-administered courses as a requirement for participation in Bath Iron Works Corporation's apprentice training program may, upon readmission to the program, request recognition of grades received while in a disenrolled status. Retroactive recognition will be granted for courses completed in the year preceding the request.

#### Special Circumstances

- Former students who have received their undergraduate degrees at MMA and now wish to pursue a second undergraduate degree at MMA should apply using the readmission application. To be a candidate for a second undergraduate degree, a student must have the recommendation of the department chair of the major.
- Students seeking readmission who wish to change their majors may indicate the desired new major on the application for readmission. If approved, this procedure eliminates the need for the student to complete a Change of Major request after enrollment.
- Students who have attended other institutions of higher learning since their last enrollment at MMA must have an official transcript from each institution attended submitted directly to the Director of Admissions. These transcripts must be received and satisfactory performance must be indicated before approval for registration will be granted. Failure to report any schools attended will result in your application not being accepted. In cases where the courses are in progress and transcripts will not be available in time, a progress report from the course instructor(s) must be submitted. If readmitted, a student will not necessarily be awarded transfer credit work taken at another institution after dismissal from MMA.
- Co-op students on an official work term and also taking courses at MMA are not required to apply for readmission if they withdraw from all courses during the work term. Their enrollment status is retained as a co-op student at work.
- Students who have been dismissed as a consequence of disciplinary infractions may only be readmitted after a period of documented exemplary good conduct. Students who have been dismissed for academic failure will be considered only upon evidence of improved academic potential. As a matter of general policy, a student who has resigned rather than face a disciplinary hearing for an infraction of student regulations will not be considered for readmission.

#### Leave of Absence

Students may be granted a leave of absence (LOA) for financial or personal reasons not related to academic or disciplinary issues. A leave of absence for a specific period of time -- not to exceed one year -- will be granted by the Registrar upon the endorsement of the Vice President for Enrollment Management, Dean of Student Services, or the Vice President for Academic Affairs.

Requests to return from a Leave of Absence <http://admissions.mainemaritime.edu/readmitapp.php> can be made through the Director

of Admissions. Students may return to MMA at the start of the fall semester, the spring semester, annual training cruise, cadet shipping, or co-operative. The request to return must be completed by the following dates for consideration:

- Fall semester - July 1
- Spring semester - November 1
- Training cruise/Cooperative - March 1

If an LOA expires (extends beyond one year), you must apply for readmission through the Office of Admissions. Be aware that this situation may impact your academic class standing and graduation requirements. Contact the Director of Admissions for further details.

### Administrative Dismissal

From time to time, a student fails to comply with an administrative requirement of the Academy. Such requirements include, but are not limited to, financial obligations, required documentation for medical needs, or necessary immigration documentation. Failure to comply with such administrative requirements may be cause for dismissal by the Vice President for Academic Affairs, Vice President for Finance/Administrative/Governmental Affairs, Dean of Student Services, or their designee. A student so dismissed may appeal that dismissal to the President.

Such an appeal must be made in writing within three work days of notification of dismissal and include a clearly stated rationale for appeal. The President may choose not to consider the appeal, to hear the appeal with the student present, or grant the appeal outright. The President will respond to the appeal in writing within 10 working days, not counting days the President may not be on campus. There is no appeal of the President's decision.

## Affording MMA

THE DECISION to attend college requires both a personal and financial commitment. Maine Maritime Academy believes that this important undertaking should not be constrained by financial considerations. The college strives to make a Maine Maritime Academy education affordable to all qualified applicants and enrolled students whenever possible.

More than seventy percent of our students currently receive need-based financial aid. Federal, State, and campus-based programs are available to help defray the cost of education. The typical length of matriculation for on-campus, residential students is 4 or 5 years for a B.S. degree, 2 years for an A.S. degree, and 1 year for a M.S. degree. Maine Maritime Academy achieves a graduation rate for all first-time B.S. students of 69% within 6 years (based on the 1997-2001 cohort years and as reported to the Integrated Post-Secondary Education Data System/IPEDS; most recent year datum, 2001 cohort, is 64% within 6 years). Ninety-eight percent of MMA students enrolled in the unlimited license programs pass the U.S. Coast Guard license exam upon their first attempt, based on data for the 2008 academic year.

Based on the graduating class of 2008, the average student indebtedness was \$36,396.00.

Any enrolled student who qualifies for aid will receive it to the extent that funds are available. The amount of the award is dependent upon financial need and, therefore, reflects the family's or individual's financial circumstances. Maine Maritime Academy treats all such information as confidential.

In general, you are eligible for undergraduate financial aid at Maine Maritime Academy if you:

1. Are a U.S. citizen or an eligible non-citizen
2. Are making satisfactory academic progress as defined in the catalog
3. Are not in default on a prior loan or do not owe a refund on a grant or scholarship
4. Registered with the Selective Service (males only)
5. Demonstrate financial need.

Federal, State, and campus aid is awarded on the basis of need. Need is the difference between your costs (tuition, room, board, books, supplies, and personal expenses) and the amount that you and your family are expected to pay as determined by a standard formula established by Congress and regulated by the Department of Education. This amount is called the Expected Family Contribution (EFC). Thus,  $COST - EFC = NEED$ . The basis for determining the expected family contribution at Maine Maritime Academy is the [Free Application for Federal Student Aid](#) (FAFSA), provided by the U.S. Department of Education.

Students applying for financial assistance should submit a FAFSA to the Federal Student Aid Programs Office as soon as possible after January 1 of the application year, but not later than April 15. Applications are available from your high school guidance office or Maine Maritime Academy, or online at [www.fafsa.ed.gov](http://www.fafsa.ed.gov). Re-application for financial aid is required for each academic year that the student wishes to be considered for financial assistance. Parent and student tax returns and a verification worksheet may be required. Call or write the Financial Aid Office with any questions regarding the financial aid process (207) 326-2205. The Financial Aid Office is located in The Robert S. Walker Admissions and Financial Aid Center.

### [Sources of Aid](#)

#### Private Scholarships

Private organizations offer financial assistance to thousands of qualified individuals each year. High schools, community organizations, professional associations, businesses, and industries frequently offer scholarships to students. Some are based on need or scholastic achievement, but many are not. High school guidance counselors and public libraries have lists of organizations offering these scholarships, and there are several free scholarship search sites on the Internet.

#### State Scholarships

Most states administer scholarship programs. Check with your guidance counselor to find out how to apply for these funds. State administered awards are generally designed to help full-time, undergraduate students working toward their first degree, and who have financial need. In many state programs, only the FAFSA is required.

#### Federal Financial Aid Programs

[Supplemental Educational Opportunity Grants](#) (SEOG) are awarded by the college to undergraduate students who demonstrate extraordinary financial need. The awards range from \$400 to \$1,000 per year and do not have to be repaid. Perkins Loans offer low interest rates. These loan funds are made available by the college to students who demonstrate exceptional financial need. The maximum amount a student with high need may borrow is \$4,000 a year, \$20,000 lifetime.

Students with demonstrated financial need who are awarded Federal College Work-Study funds may work up to 20 hours each week, on campus or in community service, during the academic year. Specific work schedules are arranged around class time. Work-Study awards generally range from \$500 to \$1,500 per year. Students will be paid minimum wage or a maximum of \$10.25 per hour. Pay range is determined by the student's supervisor.

Students may become eligible for the Federal Pell Grant by completing the FAFSA each year until the completion of the bachelor's degree. These federal grants currently range from \$976 to \$5,350 per year and do not have to be repaid. Amounts vary each year and are determined by the Department of Education.

Stafford Loans (subsidized) are available to students with verified need enrolled in a degree-seeking program. Applications may be obtained at the Financial Aid office as well as most banks or lenders. Loan funds are disbursed in two payments. A student with demonstrated need who is enrolled on at least a half-time basis is eligible for the following Stafford Loan amounts: \$3,500 in the first academic year of an undergraduate program; \$4,500 in the second year; and \$5,500 per academic year thereafter until successful completion of an undergraduate degree. Graduate and professional students are eligible for \$8,500 subsidized Stafford funds per year. The lifetime maximum Stafford Loan amount is \$23,000 for undergraduates; graduate students demonstrating financial need may borrow up to a maximum amount of \$138,000, including loans received at the undergraduate level. Unsubsidized Stafford Loans requiring interest payments while the student is in college are available in the same amounts for students who do not qualify for the Stafford loan (determined by the FAFSA).

A variety of parent and other alternative loans are available. Contact the Financial Aid Office for specific recommendations.

#### Veterans Educational Assistance

Maine Maritime Academy programs are approved for the enrollment of military personnel, veterans, and their eligible dependents under the various educational assistance programs (GI Bills). Programs are approved by the State Approving Agency for Veterans Education Programs. Students who plan to receive veterans' education benefits must see the Registrar.

#### Institutional Scholarship, Grant, and Loan Programs

Limited institutional scholarships, grants, and loan programs are available through the generosity of friends and alumni of Maine Maritime Academy, each with criteria developed by donors and awarded annually to students with financial need; academic progress also may be taken into consideration. In order to be considered for such funds, a student must submit a FAFSA. Recipients will be expected to write thank you notes to the donors.

#### Extended Payment Program

The Academy has an agreement with Tuition Management Systems (TMS) which offers a monthly payment plan. Tuition Management Systems offers a 10-month plan with equal payments due July 1 - April 1. This plan can be used to cover all MMA costs or to supplement final costs after financial aid. Tuition Management Systems offers a 10-month plan in coordination with loans as well, for those who want to lower their monthly payments. Information is sent directly to entering first year students from TMS, or contact the Finance Office at (207-326-2243) for details.

#### NROTC College and Scholarship Programs

The [Naval Reserve Officer Training Corps](#) (NROTC) Program is divided into two major categories of students, those who are on Navy scholarship (Scholarship Program) and those who are not (College Program). Four-year Navy or Marine Corps ROTC scholarships are awarded to prospective first-year college students annually by Chief of Naval Education and Training on a competitive basis nationwide. These scholarships provide full tuition, fees, a \$375 book allowance, uniforms, and a \$250-\$400 subsistence allowance per month depending on the year of the student. Four-year national scholarship winners who attend Maine Maritime Academy are also provided by MMA free room and board while at MMA, or a stipend of \$1,000 per semester in lieu of room and board if not residing in the dormitory.

NROTC students who are not on scholarship are enrolled in the NROTC College Program. College Program students receive uniforms and books for Naval Science courses for the entire time they are enrolled, and a subsistence allowance of \$350 per month during the junior year and \$400 per month during the senior year. College Program students may compete for scholarships

during their first two years at college. If selected for scholarship, College Program students will receive the same benefits as four-year national scholarship recipients, but not the room and board gratuity from MMA. The length of these scholarships (3.5, 3, 2.5, or 2 years) is dependent on when the student is selected for the scholarship and becomes physically qualified. College Program students incur no obligation to the Navy until they begin their junior year or are awarded and accept a scholarship.

NROTC graduates receive active duty commissions in the Navy or Marine Corps. Please refer to the section on [Naval Service Commissioning Programs](#) in this catalog for more information. Accepting an NROTC scholarship after accepting standard financial aid may result in an adjustment of financial aid funds.

#### Merchant Marine Reserve/U.S. Navy Reserve Program

All physically qualified Maine Maritime Academy students enrolled in the U.S. Coast Guard unlimited license program, and who are between the ages of 17 and 25, are eligible to compete for this reserve program. The Maritime Administration is presently funding \$8,000 yearly for four years to qualified students. Students admitted to this program who are awarded the federal incentive payment will be obligated to apply for, be offered, and to have accepted a Midshipman status in the U.S. Navy Reserve, (Merchant Marine Reserve, USNR) and simultaneously to have applied for and have been accepted for Enlisted Reserve status.

Please see the section on [Naval Service Commissioning Programs](#) in this catalog for more information.

These funds are considered a resource and are expected to be used for educational funding. Financial aid awards may need to be revised after a student accepts the MMR agreement.

#### Regular Student Wage and Off-Campus Employment Programs

Students who do not receive funds under the Federal College Work-Study program may seek employment on campus up to 20 hours each week during the academic year. On campus employment for regular student wages is limited. A website is available where jobs are posted on a regular basis. (<http://studentjobs.mma.edu/>)

### Financial Aid Policies

#### Independent Student Status

To qualify for independent status, a student must be able to meet the Department of Education Criteria for Independency.

A student is automatically independent if the student:

1. Is 24 years old by January 1 of the academic year he/she is going to enter college; or
2. Is working on a Master's Degree; or
3. Is married; or
4. Has dependent children that receive more than half of their support from the student; or
5. Has dependents (other than your children or spouse) who live with the student and who receive more than half of their support from the student; or
6. Is a veteran of the U.S. Armed Forces (Served two years of active duty). A DD214 will be required; or
7. Is currently serving on active duty in the U.S. Armed Forces for purposes other than training; or
8. At any time since turning 13, both parents were deceased, and the student was in foster care or a dependent or ward of the court; or
9. Is an emancipated minor as determined by a court in the state of legal residence; or
10. Is in legal guardianship as determined by a court in the state of legal residence; or
11. At any time on or after July 1, 2008, the high school or school district homeless liaison determines that the student was an unaccompanied youth who was homeless; or

12. At any time on or after July 1, 2008, the director of an emergency shelter or transitional housing program funded by the U.S. Department of Housing and Urban Development determines that the student was an unaccompanied youth who was homeless; or
13. At any time on or after July 1, 2008, the director of a runaway or homeless youth basic center or transitional living program determines that the student was an unaccompanied youth who was homeless or self-supporting and at risk of being homeless.

Documentation may be required for any yes answers.

The Director of Financial Aid, using professional judgment, may consider a student with documented unusual circumstances as independent. A parent's unwillingness to contribute to his/her child's education is not grounds for independent status.

#### Falsification

Parents and students must supply accurate and complete information on all financial aid applications. Willful falsification or omission of information is a criminal offense punishable under Maine and federal laws. Intentional omission or falsification may result in withdrawal of all financial assistance or repayment of any assistance granted by the Academy's Financial Aid Office.

#### Director of Financial Aid Discretion

In some cases, the Director of Financial Aid may adjust the expected family contribution derived from the federal methodology system if the officer has documented reason to believe that the original contribution calculated does not accurately reflect the student's or parents' ability to contribute to the cost of attendance. This is called a Request for Review and will require full documentation.

#### Financial Aid and Academic Standing

Students receiving financial assistance are expected to maintain satisfactory progress toward a degree. Any student meeting the following criteria will automatically be considered as making sufficient satisfactory academic progress for financial aid purposes:

- A minimum cumulative grade point average of 1.80 and successful completion of at least 24 semester credit hours after 2 semesters;
- A minimum cumulative grade point average of a 2.0 and completion of 48 semester credit hours after 4 semesters;
- A minimum cumulative grade point average of a 2.0 and completion of 72 semester credit hours after 6 semesters;
- A minimum cumulative grade point average of a 2.0 and completion of 96 semester credit hours after 8 semesters.

Students not meeting the above conditions will be considered on a case-by-case basis by the Director of Financial Aid to determine if satisfactory progress is being made.

In no instance will an undergraduate student be eligible for financial assistance beyond six years of study, or if the minimum cumulative grade point average of 2.0 has not been met after completing four semesters as a full-time student. Financial Aid includes all federal and state grants, all federal and institutional loans, work study and all institutional scholarships.

#### Governance

The above and all other policies governing the administration of financial aid at Maine Maritime Academy are in accordance with federal and state laws regulating federal and state aid programs which were current at the time of publication.

Students have the right to appeal any financial aid decisions to the Financial Aid Review Committee which is comprised of the Director of Admissions, the Director of Financial Aid, the Registrar, the Director of Residential Life, and a faculty representative. Appeals must be made in writing and submitted to the Director of Financial Aid.

#### Tuition and Fees

##### Tuition

Tuition rates normally are established each February for the next academic year by the Board of Trustees.

For the Fall semester of 2010, undergraduate tuition is as follows:

\$4,140 In-State  
\$6,210 New England Regional\*  
\$8,500 Out-of-State

#### Course Overload Fees:

\$320/credit In-State  
\$480/credit New England Regional\*  
\$600/credit Out-of-State

\*The Academy is a member of the New England Regional Student Program (NERSP), and, therefore, eligible students from New England states that do not have similar academic programs pay the Maine in-state tuition rate plus 50 percent. Residents of Quebec, the Canadian Maritime Provinces, and Puerto Rico also are eligible.

Under the NERSP, the following MMA majors are available to students from the states indicated:

- Marine Biology: CT, VT
- Marine Science: CT, MA, NH, VT
- Small Vessel Operations: CT, MA, NH, RI, VT
- Power Engineering Operations: CT, NH, RI, VT
- Power Engineering Technology: CT, NH, RI, VT
- International Business & Logistics: CT, NH, RI, VT
- Interdisciplinary Studies: CT, VT
- Marine Systems Engineering (Non-License Track): CT, NH, RI, VT

Students from Connecticut, Rhode Island, New Hampshire, Vermont, and Puerto Rico who enroll in one of the following four majors qualify for in-state tuition rates. These four majors lead to a U.S. Coast Guard unlimited license and require membership in the Regiment of Midshipmen. An Admissions Office representative can determine if a student qualifies for these majors. See the catalog section on [Student Life](#) for more information on the Regiment of Midshipmen and the section on [Admissions](#) for the requirements for applicants to the U.S. Coast Guard license program.

- Marine Transportation Operations
- Marine Systems Engineering (License Track)
- Marine Engineering Operations
- Marine Engineering Technology

#### Room and Board

Room fees are based on double occupancy. Single rooms may be requested through the Student Affairs Office. Requests will be granted only when double occupancy is not required by the Academy to satisfy housing demands. A student will not be charged the single room rate if the student has not applied for a single room and has followed proper procedures but is assigned a single room for the convenience of the Academy.

Students who qualify for off-campus living may cancel the reservation for a room in Curtis Hall by making written application to the Associate Director of Student Services no later than two weeks after the beginning of each semester. Those students who cancel the reservation will be billed a \$200 or a \$400 fee and/or charged on a pro-rated basis.

The Academy reserves the option to place three students in a room in Curtis Hall during the fall and spring semesters. Students will receive an adjustment in room rates at the end of the semester based upon the amount of time that triple occupancy occurred.

All resident students who pay a room fee are required to participate in a board plan. Board fees are billed each semester. Three meal plan options are available. A 5-day lunch plan is available for commuter students on weekdays. The dining room is open to all resident students during meal hours on an unlimited basis.

In those cases where a medical doctor prescribes a special diet for a student, the food service will, if possible, serve the special diet on an individual basis.

Non-resident students may gain access to the dining room by paying an individual meal charge at the door or may purchase a meal card using the "point" system.

Room and board charges (as of the Fall semester 2010) for students living on campus are as follows:

- \$4,435 All on-campus students with a meal plan.

Board based on 5 lunches, M-F, for commuter students only:

- \$935

Fees for Academic Year 2010-2011:

The following annual fees are required of all students:

Application Fee: (charged only once, unless reapplying)	\$15
Administrative Fee:	\$600
Student Life Fee:	\$205
Security Deposit:	\$200
Technology Fee:	\$840
Recreation Fee:	\$100
Energy Fee:	\$500

The following fees may be required annually:

Unlimited License Program Participation	\$3,400
Cruise Participation, <i>T.S. State of Maine</i> (eligible, non-unlimited license students)	\$4,250
Cruise Participation, SVO	\$1,260
Late Registration Fee	\$50
SVO Majors Fee	\$800
Marine Biology and Marine Science Majors Fee	\$740
Co-op Educational Experience	\$900
Medical Insurance*	\$588

\*All matriculating undergraduate students are required to be enrolled in a medical insurance plan. Each student must provide proof of insurance or participate in the Academy-sponsored medical insurance plan. A brochure outlining the various benefits of this plan is mailed to all matriculating students in July. First-year students should note that the rejection deadline is September 1 in order to have the charge removed from the bill. Students and/or their families are responsible for notifying Health Services of any changes.

In addition to the fees listed above, the Academy charges certain fees relating to students' majors and specific courses. A schedule of fees is published each year and mailed with the first-term bill. Current examples include the following:

Bridge Simulator Lab Fee (per credit hour)	\$125
Tug/Barge Operations Course Fee	\$1,050
Fire Training	\$680
Marine Biology and Marine Science Majors Lab Fee	\$700
Physics and Chemistry Courses Lab Fee	\$300
Welding and Machine Tool Ops. Courses Lab Fee	\$325
Skin & Scuba Diving Course Fee	\$265
NS499 License Prep Course Fee	\$150

#### U.S. Coast Guard User Fees

Students pursuing a U.S. Coast Guard license are advised that the Coast Guard charges user fees for life boat exams, license application evaluations, and documents (i.e., license and [Merchant Mariner's documents](#)). These fees are not included in the aforementioned tuition and fees requirements and are paid directly to the Coast Guard as required.

#### TWIC Card Fee

[TWIC](#) (Transportation Workers Identification Credential) cards are required of all students in the unlimited license program to participate in training cruises and cadet shipping, and for some other students for some cooperative assignments. Arrangements for obtaining a TWIC card are made through the Continuing Education Office early in the fall of the freshman year. Students wishing to

obtain their TWIC card on campus will need to pay a processing fee of \$150 to the Maine Maritime Academy, Finance Office.

## Summary of Additional Requirements and Fees Students May Encounter

<a href="#">U.S. Passport</a> fee by mail	\$75
<a href="#">U.S. Passport</a> fee in person	\$100
U.S. Passport Photos	\$15-\$20
TWIC	\$132.50
Merchant Mariner Credential	\$140.00

## Deposits

### Deposit

A deposit of \$100 is required of all degree seeking students upon their acceptance. This deposit is refundable if Admissions is notified of the candidate's decision to withdraw his/her acceptance on or before May 1<sup>st</sup>.

### Security Deposit

A contingency deposit of \$200 is required from all students. This deposit must be maintained as long as the student is enrolled at Maine Maritime Academy.

The deposit will be retained for unreturned Academy-issued equipment, clothing, library books, or any other unpaid charges. Any remaining balance, up to \$200, will also be retained if a student disenrolls without notifying the Registrar's Office before the first day of classes.

Students who maintain residence in Curtis Hall are not held liable for the cost of routine repairs to corridors or public areas but are charged on a proportional basis for willful damage caused by unidentified students resulting from negligence or vandalism. Determination and scope of damage charges are the responsibility of the Dean of Student Services.

## Payment and Refund Policies

### Payment Schedule

In determining the amount due each semester, the student may subtract any scholarships, loans, grants, or payment plans under which payments are made directly to the Academy by the sponsoring organization and for which the Academy had been notified in writing of the student's eligibility and acceptance.

It is the policy of Maine Maritime Academy that all expenses, including tuition, fees, room, board, and deposits are due and are to be paid by each student on or before the dates shown in the following schedule:

Semester	Payment Due Date
Fall Semester	Tuition deposit upon acceptance or May 1
Fall Semester	August 15
Spring Semester	January 5

Payments sent by mail should be mailed at least five business days in advance of the due date to assure receipt by the due date. Those choosing to pay by Visa or Mastercard may do so by calling the Cashier's Office at 207-326-2236.

As part of the formal registration process each semester, student accounts must be paid in full, or satisfactory arrangements to make payments must be approved by the Finance Office, before students enter classes at the beginning of a new semester. Failure to follow this process may result in an additional registration fee. Students with unresolved outstanding balances may be disqualified from participation in all academic and non-academic activities and may be prevented from entering the residence hall or utilizing their meal cards.

### Late Payment Fees

The college will charge interest on all unpaid accounts beyond a 30-day grace period at the rate of one percent per month or 12 percent per annum.

Students who disenroll with an unpaid balance are responsible for making payment arrangements with the Finance Office upon departure. Additional collection charges may be assessed if a satisfactory plan is not met monthly, or if turned over to an outside collection agency.

### Student Accounts

Upon payment of the initial deposit, an account is established in the Finance Office for the student, using the student's name and an assigned number as the account identification. All checks should show the student's name and identification number on the face of the check in order to assure proper credit to the student's account. Normally, students will receive an itemized statement of account in July for the fall semester and in December for the spring semester.

If for any reason a student account is overpaid, any excess may be refunded or may be left on account for the next semester. All refunds will be paid by check within 10 days following a request.

### Tuition Payment Plans

Parents and students who prefer to pay for their educational expenses in monthly installments may want to consider a tuition payment plan available for students of Maine Maritime Academy. A mailing from Tuition Management Systems, who offers a tuition payment plan, will be sent directly to students and their parents. Refer to the section entitled Extended Payment Program under Sources of Aid.

### Veterans and ROTC Students

Veterans and ROTC students who receive allowances directly from the government are responsible for payment of their fees and charges on the same basis as other students.

### Withdrawal

Students withdrawing from the Academy must complete the formal withdrawal procedure as prescribed by the Vice President for Academic Affairs. Failure to follow the prescribed procedures, especially at the end of a semester, may result in additional charges until the student is officially disenrolled.

### Refund Policy

Students who voluntarily withdraw from the Academy are entitled to a refund of tuition, fees, and room and board charges, according to the following schedule:

#### ***First Year Students:***

- After beginning of orientation (but prior to beginning of classes): 100 percent of tuition and fees, plus 95 percent of room and board.

#### ***All Students:***

- Withdrawal within first day of classes up to end of second week: Unused deposits, plus 90 percent of tuition, room and board;
- Withdrawal during third or fourth week: Unused deposits, plus 50 percent of tuition, room and board;
- Withdrawal during fifth, sixth, seventh, or eighth week: Unused deposits, plus 25 percent of tuition, room and board;
- Withdrawal during ninth week or beyond: No refund.

The same percentages will be used for returning private or Academy financial aid. No fees are refunded after the first day of classes; the exception to this is summer co-op charges. Students who are suspended or dismissed after the start of a semester are not entitled to any refund. The Department of Education mandates the return of federal financial aid for Title IV recipients. This refund policy does not pertain to withdrawal from any class(es) after the add/drop period. It only applies to students voluntarily withdrawing entirely from Maine Maritime Academy.

### Special Refunds

Refunds of up to 100 percent of tuition, room, board, and fees may be granted in exceptional circumstances. Such special refunds are subject to approval by the President.

#### Planning a Total Budget

In anticipating total costs of attending Maine Maritime Academy, be certain to add funds to cover books, transportation, spending money, and clothing. First-year students also should plan for the required [laptop computer](#) and uniforms (if applicable); clothing for regimental students costs approximately \$2,400.

## The Undergraduate Academic Program

### Majors

The Academy offers the following baccalaureate degree academic majors at its Castine campus:

- Interdisciplinary Studies
- International Business and Logistics
- Marine Biology
- Marine Engineering Operations\*
- Marine Engineering Technology\*
- Marine Systems Engineering\* (License Track)
- Marine Systems Engineering\*\* (Non-License Track)
- Marine Transportation Operations\*
- Marine Science
- Power Engineering Operations
- Power Engineering Technology
- Small Vessel Operations

The Academy offers the following associate degree academic majors at its Castine campus:

- Small Craft Design\*\*\*
- Small Vessel Systems\*\*\*
- Small Vessel Operations

\*These majors lead to a U.S. Coast Guard unlimited license and require participation in the Regiment of Midshipmen. See the catalog section entitled [Student Life](#) for information on the Regiment.

\*\*Marine Systems Engineering (Non-License Track) requires first-year students to participate in the Regiment of Midshipmen and the first-year cruise.

\*\*\*Small Craft Design and Small Vessel Systems are offered as Associate Degree Programs by Maine Maritime Academy in association with The Landing School of Boatbuilding and Design in Kennebunkport, Maine. Residence at Maine Maritime Academy is required for the first year at Castine and at The Landing School in Kennebunkport for the second year of the program.

### Undeclared Major

This option of an undeclared major is only available for the Spring term and is designed primarily for transfer students. The following semester, students must declare a major and select courses in consultation with an advisor to meet the requirements of a declared major. Students may enroll as non-declared for one semester only.

### MMA/General Dynamics Corporation Programs

In addition to the fifteen undergraduate majors listed above, two other majors leading to an Associate in Science degree are offered to employees of General Dynamics Corporation at Bath Iron Works Shipyard:

#### Bath Iron Works Shipyard

Two Associate in Science majors, Ship Design and Ship Production, are offered via a satellite program for apprentices of General Dynamics Corporation's Bath Iron Works Shipyard in Bath, Maine. In these programs, courses are offered on-site in Bath. These majors are administered by the Engineering Department at MMA.

### Selecting a Major and Changing Majors

It is necessary to select an academic major prior to registering for the fall semester of the first year. Thereafter, it is possible to change a major after consultation with appropriate academic advisors and the respective program coordinator, as may be necessary. A change of major must be approved by the faculty coordinator of the new major and may be restricted by the student's academic performance as well as the capacity of the new program. Students who request a change in major must meet Academy and programmatic requirements that are in place. A change of major requires careful scheduling and may necessitate attending summer classes or additional semesters to complete all required courses. If a circumstance arises which in the opinion of the student or the Vice President for Academic Affairs causes undue hardship on the student or the school in fulfilling the obligations created by a situation such as those addressed here, it may be resolved by the Vice President for Academic Affairs in consultation with the student, the student's advisor and/or the Department Chair involved. Students changing majors are subject to the Priority for Course Registration of the [Academic Policies](#) chapter and may not be on "track".

During the fall semester of the first year, baccalaureate candidates in U.S. Coast Guard unlimited license programs take courses in both nautical science and marine engineering to gain insight into both fields of study. Upon the successful completion of the spring semester of the first year, these students register for the annual cruise aboard the *T.S. State of Maine*.

### Minor Programs and Concentrations

In addition to the academic majors offered at Maine Maritime Academy, all Departments offer opportunities for specializations in one or more areas of study. Students are encouraged to participate in one or more of these programs and decide on a minor or concentration as early as possible in order to meet the necessary requirements for their targeted graduation date. Registration materials and [academic requirements](#) for minor programs and concentrations can be obtained from the Registrar, faculty program advisors, and the [Academic Policies](#) section of this catalog.

## Academic Policies

### Responsibilities

It is the student's responsibility to fulfill all academic requirements to achieve his or her selected academic major. It is the responsibility of the faculty and staff to advise the student and to facilitate the student's effort.

### Pre-Requisites

Pre-requisites for courses may be waived by consent of the instructor, unless the catalog specifically states that the pre-requisite may not be waived. A minimum grade may be included as part of each pre-requisite.

### Grades

Grades with their quality points are reported as described below. The grade point average (GPA) is determined by multiplying the quality points by the credit hours attempted for each course, then summing these products for all courses and dividing by the total credit hours attempted, including those courses with failing grades.

### Quality Points

A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
C-	1.7
D+	1.3
D	1.0
D-	0.7
F	0.0 Failure (no credit received).
S	Satisfactory completion of a course. Not included in the computation of grade point average (GPA) but credit hours are applicable toward graduation requirements.
U	Unsatisfactory completion of a course. No quality points for computation of GPA and no assignment of credit hours.
W	Withdrawal from a course after the add/drop period, but before the seven calendar days following the midpoint of the course. Withdrawal from a half-semester course will be possible only within the first two weeks of the course.
I	Incomplete may be given at the discretion of the instructor and with the approval of the Academic Dean if a student, because of an incapacitating illness or exceptional circumstances beyond his or her control, fails to take a final examination or to complete a major assignment. In the absence of special circumstances, a student who receives an incomplete when grades are recorded will receive a failing grade for the course unless the deficiency is rectified within two weeks of the conclusion of the semester.
AUDIT	Course taken for no credit.

Students may initiate withdrawal from a course prior to the seventh calendar day following the midpoint of the course by obtaining the appropriate form from the Registrar and complying with the instructions stated thereon.

Faculty may assign withdrawal grades in a course after the add/drop period, but before the seventh calendar day following the midpoint of the semester. The faculty member will contact the student in question in advance of taking this action and inform the student that he/she is in jeopardy of being withdrawn. At this time, alternatives to withdrawal will be discussed. If a faculty member decides that it is in the best interest of the student and/or the Academy to withdraw a student from a course, the faculty member

will send the withdrawal grade in writing to the Registrar via the Academic Dean with a copy to the student. An appropriate short statement about why the student is being withdrawn from the course will be included in this written notification.

Students may retake courses to replace a grade, provided the course is retaken at the Academy. The grade of the succeeding course replaces the original grade in the calculation of the cumulative point average, but both grades appear on the transcript.

Grades from other colleges are not used in the computation of the grade point average, although course credit is granted as described under the Transfer Credit section (in the [Degree Requirements](#) section).

Any changes in grades submitted to the Registrar must be approved by the Academic Dean.

### [Academic Appeal](#)

Students may appeal unresolved concerns of an academic matter through a process outlined in the [Student Handbook](#).

### [Student Classifications](#)

#### Full-time Student

A full-time student must meet the stated admission requirements for the undergraduate program for which he/she is applying; register for 12 or more credit hours each semester; register for a specific degree program; and comply with all Academy policies which apply to his/her degree program.

#### Part-time Student

A part-time student is one who registers for fewer than 12 credit hours per semester while meeting the stated admission requirements for the undergraduate program for which he/she is applying and who registers for a specific degree program. A part-time student must also comply with the established Academy policies which apply to his/her degree program.

#### Probationary Student

A probationary student is one who has been admitted to the Academy under the condition that he/she successfully completes stated special admissions requirements.

#### Non-Degree Student

A non-degree student is one who is not registered for a degree program at the Academy. Non-degree students must apply for admission to the Academy through the Admissions Office. Appropriate supporting documentation (copy of high school diploma, transcripts, etc.) will be required unless waived by the Academic Dean or his/her designee. Acceptance is based on academic preparation, potential for success, and course availability. Current MMA full- and part-time students have priority in course enrollment. Non-degree students are not entitled to MMA student services. A non-degree student can apply a maximum of 30 Maine Maritime Academy credit hours toward the Academy's Bachelor of Science degree and 15 credits toward the Associate in Science degree.

### [Mathematics Placement of Incoming Students](#)

Members of the math faculty and the admissions staff jointly review each incoming student's admissions file to determine the most appropriate point in the math sequence at which the student should commence study. Consideration is given to information such as the student's proposed major, prior math history, and SAT and/or ACT scores. The recommendation on initial placement can be modified if approved by the student's advisor or program coordinator. In the case where a student transfers in credit for a math course or has appropriate Advance Placement Test scores, the transfer credit and AP score will take precedence.

Engineering Department students in the Bachelor of Science majors should note that Ms-110 Technical Calculus I or Ms-150 Calculus I is a prerequisite to the normal course offerings in the fall of the second year.

### [Attendance Policy](#)

Students are expected to adhere to the attendance policy of faculty members as expressed in the course syllabus.

NOTE: The following attendance policy applies to STCW (Standards of Training, Certification, and

Watchkeeping) courses.

- Maine Maritime Academy courses in which there is STCW imbedded material require mandatory attendance.
- The course instructor will maintain attendance records.
- In the event of a class absence due to special circumstances, the material will be made up to the satisfaction of the course instructor.

## Official Transcripts

For a nominal fee, transcripts are available through the Registrar's Office. Official copies of a student's transcript are sent directly to colleges, employers, and other agencies upon the written request of a student or graduate. Matriculating students may obtain copies of their transcripts without the official seal of the Academy for their personal use. No official transcript will be issued until all financial obligations with the Academy have been met. In the case of loans, financial obligations must be in satisfactory status with the Finance Office in order for a transcript to be released.

## Dean's List

A Dean's List will be prepared at the close of the fall and spring semesters of each academic year. This will identify those full-time students whose semester GPA is not less than 3.3 and whose records indicate no course grade below C for the semester.

## Academic Advising

Academic advising is the process by which faculty and staff advisors provide information and advice to assigned student advisees. The purpose is for advisors to assist students in making decisions that will result in the completion of their degree programs in the most effective way. This process is an important part of the college education at Maine Maritime Academy. A successful academic advising program is dependent upon the shared commitment of students, faculty, staff, and administration.

Students are responsible for scheduling, preparing for, and keeping advising appointments; collecting appropriate information; knowing the basic requirements for their individual degree program and college policies; and making their own final decisions along with taking responsibility for the results.

Advisors are responsible for having a thorough knowledge of the degree requirements for the program in which their advisees are enrolled and college policies and procedures that affect their advisees. Advisors should also be aware of what career opportunities graduates have and of the other advising and counseling resources available at the college. Advisors may need to contact advisees to schedule meetings, particularly new advisees and those who are having academic problems. Advisors are expected to be available to students on a regular basis, monitor their advisees' progress, assist in considering options, and make referrals to other sources of help.

The Administration of the college will support academic advisors by providing clear and accurate information on policies, procedures, resources and programs. The college is committed to helping advisors develop effective advising skills, to evaluate the advising system, and to make improvements where needed. Further, the college acknowledges the time requirements for effective advising and the important contribution advisors make through appropriate recognition and reward.

## Students at Risk Policy

Students at risk are defined as all students currently on academic probation. A student at risk will:

- Be required to meet with an assigned "special" advisor once a week and meet regularly with his/her academic advisor
- Not be allowed to register for more than 16 credit hours of course work per semester
- Be required to successfully retake all required courses he/she failed
- Be required to retake all courses required as part of their major in which he/she received a grade of "D"
- Be removed from the "at risk" category upon obtaining a cumulative GPA of 2.0 or higher

## Academic Forgiveness Policy

Students with prior poor academic performance may petition, on the advice of the Academic Dean and with the approval of the Academic Board, to have certain courses removed from the calculation of the overall Grade Point Average. This policy is restricted to students that are returning after an absence of several years or have changed majors. The intent is to remove from calculation of the GPA courses that no longer have any bearing on the new degree program being pursued.

## Academic Standing for Undergraduate Degree Candidates

All students must establish a minimum cumulative grade point average, as defined below, to remain in sound academic standing and to assure class progression. All students (including first-year students) not attaining these standards will be placed on academic warning or academic probation, and may be ineligible for cruise/co-ops, or may be disenrolled.

The minimum cumulative grade point averages to remain in good academic standing and to assure continuance at the end of each semester at the Academy are:

First year:

- First semester: 1.60
- Second semester: 1.80\*

Second year:

- First semester: 1.90
- Thereafter: a minimum of 2.00

\*Small Craft Design and Small Vessel Systems require a 2.0 at the end of the first year of study. Students in the BIW curriculum must achieve a 2.41 (equivalent to 80 out of 100) or above each trimester of study.

*Notes: A minimum cumulative grade point average of 2.00 and a minimum core grade point average of 2.25 in some majors are required for graduation. A higher minimum acceptable semester and/or cumulative GPA may be established by individual departments or academic programs. Core courses are listed under the curriculum for each major where appropriate.*

In addition, each student must fulfill the required Academy and programmatic hours to demonstrate reasonable progress towards graduation as determined by the Academic Board. All undergraduate students must have at least a 2.0 grade point average and, if required by their major, a core course grade point average of 2.25, at the start of their fifth semester at the Academy in order to be considered as making satisfactory progress toward their degree. Students who do not meet these criteria will be classified as not making progress toward their degree.

## Academic Board

The Academic Board is chaired by the Academic Dean and is composed of the chairs of the Arts and Sciences, Engineering, International Business and Logistics, Marine Science, Marine Transportation, and Naval Science departments; one faculty member elected by the Faculty Senate; the Dean of Student Services; the V.P. for Enrollment Management/Commandant; the Director of Athletics; and the Director of Admissions.

Sitting as advisory members are the Registrar, the Director of Financial Aid and the Associate Director of Student Services.

The Board reviews the academic standing of all students at the conclusion of each semester and recommends appropriate administrative action to the Academic Dean. Decisions of the Academic Board may be appealed to the President.

## Special Academic Categories

Students who fail to meet established academic standards may be subject to one of the following administrative actions:

### Academic Warning

The mildest form of sanction issued by the Academic Board. Students will be placed in an academic warning status when their academic performance does not meet minimum academic standards, or if their performance warrants official cautioning by the Board.

### Academic Probation

The Academic Board may place a student on academic probation because of unsatisfactory academic performance. Students on academic probation are in a conditional status, and their academic standing is evaluated at the conclusion of the semester in which they were placed on probation. While on academic probation, students must meet weekly with their "special advisor" and are encouraged to consult with their faculty advisor to ensure that satisfactory progress is made toward correction of academic deficiencies. Normally, remaining on academic probation for two consecutive semesters without significant improvement will result in a recommendation for academic disenrollment. Academic probation will jeopardize the student's financial aid status.

### Academic Disenrollment

Students not meeting the established academic criteria in regard to the minimum grade point average and failing to make satisfactory progress toward their degree may be recommended to the Academic Dean for academic disenrollment. Students disenrolled for academic deficiencies may not be eligible for re-admission after disenrollment. Students, who have been disenrolled for academic reasons, may appeal this decision to the President after discussion with the Dean, and if appropriate, with parents.

### Academic Activity While Academically Dismissed

Students who are suspended or dismissed from the Academy are not allowed to enroll in courses at the college. However, in unusual circumstances and with approval of the Academic Dean, such a student may be allowed to participate in some academic work at the Academy. Courses taken in this status will usually be allowed in order that a student may demonstrate an ability to academically perform in a particular area(s) that is/are not normally taught in other institutions, or to repeat a course(s) under close scrutiny that may have previously caused particular difficulty. Such students will be matriculated as "Non-Degree Students." Grades earned in such work will count toward a degree only with specific approval of the Academic Dean upon consultation with the Department Chair appropriate to the student's major.

Courses taken at another college or university will be considered for transfer credit by the Academic Board at the time of a student's request to be readmitted. Students who are considering such work should check with the Registrar to ensure compatibility with the Academy curriculum.

### Adding and Dropping Courses

The add/drop period is the first week of the fall and spring semesters and the first two days of summer classes. This no-penalty period is an opportunity for students to add or drop courses. Courses dropped after the add/drop period of any semester are subject to withdrawal procedures. Financial refunds are not provided for course withdrawals. Add/drop arrangements are initiated by completing a form provided by the Registrar, and obtaining approvals as indicated on the form.

### Priority for Course Registration

Maine Maritime Academy will endeavor to ensure that all students who are admitted to our academic programs can register for the required courses necessary to complete their academic programs in a timely manner (2, 4, or 5 year degree programs). In instances where students have failed courses, transferred from another institution, deviated from the recommended sequence, elected dual majors or taken a leave of absence, it may not be possible to provide all required courses in a two, four or five year time frame. Registration for non-required courses cannot be guaranteed because of possible schedule conflicts and enrollment limits. The Registrar will build a course schedule that provides students that are on track with all of their required courses and meets the elective requests of as many students as possible. The following guidelines will be used in the registration process:

- First priority for course enrollment will be for students that are on track and for whom the course is required.
- Second priority will be for students that require the course but are off track because of transfer or failures.
- Third priority will be for students wishing to take a course as an elective.
- Within the above guidelines, registration priority will be given in the following order:
  - Seniors
  - Juniors
  - Sophomores
  - First Year
  - Students dropped from an elective because of enrollment limits in one term will be put on a waiting list and given priority for enrollment in subsequent terms subject to the priorities and order listed above.

The above priorities apply to course or waiting list registration only during the official registration weeks. Courses added during the add drop week will be on a first-come, first-served basis and dependent upon space availability.

### Non-Returning Students

In order to have an orderly manner in which to administrate the status of students who elect not to return to the Academy from semester-to-semester, the following policy will be followed:

1. Students who do not pre-register will be placed in a non-returning status and the date of separation will be the last day of their activity in the current semester/cruise period.
2. Students who pre-register but who do not show up for classes in the next semester will be involuntarily separated as of the end of add/drop that semester, or upon written confirmation of non-attendance, whichever occurs first.
3. Students who do not pre-register, but who attend the Academy in the next semester/cruise period, will be allowed to

matriculate on a space-available basis and will be billed the appropriate late fees as published in the [Affording MMA](#) section of this catalog.

## Electives

**General Education Elective:** Any course in the disciplines of humanities, mathematics, science or social science. Students must meet all prerequisites.

**Technical Elective:** Any course in which a body of knowledge or technique is specifically applied to a discipline or profession and for which the student meets all prerequisites.

**Free Elective:** Any course not required in one's major that does not contain a body of knowledge substantially similar to a course already taken or required, and for which the student meets all prerequisites. In any case, such a course should represent a progressive expansion of knowledge for the student.

**Department Elective:** Any course in the department in which the major resides, not required for the student's major and for which the student meets all prerequisites.

**Business Elective:** Any Management (Ma) or Logistics (Lo) course for which the student meets all prerequisites.

**Social Science Elective:** Any social science course not specifically required in the student's major and for which the student meets all prerequisites.

**Humanities Elective:** Any humanities course not specifically required by the student's major and for which the student meets all prerequisites.

Subject to maximum credit hour limits, students are encouraged to take extra electives. Students who have completed all scheduled elective requirements may take extra electives on a satisfactory/unsatisfactory basis if desired. Such satisfactory/unsatisfactory electives will not count toward the elective requirements; be used for credit in a minor program; be computed in the GPA; or be included as part of the minimum credit hours for graduation.

## Maximum Credit Hour Loads

Students wishing to register for credit hour overloads in any semester may do so in conformity with the following:

1. A student on academic probation may not register for more than 16 credit hours in any semester.
2. A student in good standing may take no more than three additional credit hours above those required in the semester in question.
3. A student on the Dean's List in the previous semester may take up to six additional credit hours above those required for the semester in question.
4. Exceptions to the above are subject to the discretion of the student's program advisor and the Department chair of the student's major, or in the case of students on probation, approval must be sought from the Academic Dean.

Students enrolling in more than 18 credit hours not normally required by their major in a semester will incur an additional credit hour fee as described under Tuition and Fees in the [Affording MMA](#) section.

## Degree Requirements

To be eligible for the Bachelor of Science or Associate in Science Degree from Maine Maritime Academy, a candidate must complete all courses of the major program, including specified elective courses, with a cumulative grade point average of not less than 2.0. Specific major programs may additionally require a grade point average of 2.25 in designated core courses in each program. In addition, candidates in the [four majors leading to a US Coast Guard \(USCG\) unlimited license](#) are required to successfully complete the professional USCG examination and satisfactorily participate in the [Regiment of Midshipmen](#).

The various major programs have differing credit requirements, which are described in detail in the [Curricula](#) section of this catalog. It is the responsibility of the student to demonstrate completion of all requirements and to enroll in the prescribed courses. All degrees will be awarded through action of the Board of Trustees.

The graduation date appearing on the student transcript and diploma will be one of the following as applicable:

1. The scheduled commencement date for students who have completed all degree requirements by the end of the spring semester;
2. The day following the submission of a passing grade in the Junior Cruise (Cr-303) or other required summer co-op experience in the case of those seniors who have completed all other requirements;
3. The end of the fall semester for all other students. Students who graduate at this time will have their class standing based on and be considered part of the class graduating in the next scheduled spring commencement. This will not, however, preclude license-program students obtaining Coast Guard licenses upon completion of all degree requirements even if the graduation date occurs at a later time.

## Degree Honors

Significant scholastic achievement in the undergraduate programs will be recognized by appropriate endorsement of the degree diploma in the following categories:

Summa Cum Laude:	3.75 - 4.00 GPA
Magna Cum Laude:	3.50 - 3.74 GPA
Cum Laude:	3.30 - 3.49 GPA

## Credit for Life Experience

“Life Experience Credit” is credit for learning that individuals have acquired that has not been transcribed as a result of completed coursework in a college or university. The experience is evaluated at MMA to determine whether or not it is comparable in rigor, content and outcomes with coursework taught at MMA. If such learning is deemed comparable, the student may receive credit for the experience.

Assessment of life experience is a process accomplished by assessment of a portfolio prepared by the student. Students who wish to make a case for life experience begin initially by contacting the Academic Dean's office. It is there that the screening process begins. If it is determined that the student is a candidate for life experience, the student is advised how to describe, organize and document his/her materials to create a case for life experience. Subsequently, the student makes an appointment with the appropriate Department Chair to discuss these materials. The Department Chair decides whether the student's prior learning experience warrants referral and further consideration by a faculty evaluator.

For four-year students, a maximum of 16 credits may be earned in the life experience program; for two-year students a total of 8 credit hours may be earned for life experience. Credits may be applied toward an undergraduate degree or licensure. Upon approval of the Academic Dean, the applicant's transcript will be marked to show credit hours earned, with a notation that the credit hours were earned for life experience. A fee equivalent to one-half the regular charge per credit hour will be assessed for life experience credits. Note: These credits do not fill the residency requirements for the degree.

## Study Abroad

The Academy has agreements with several other colleges and universities for study abroad. Students may inquire into this possibility from their respective Department Chairs through their advisors. Program possibilities vary from major to major. All such

arrangements must be approved by the student's major department and the Academic Dean.

## Transfer Credits

To transfer academic credits to an undergraduate program, students who are applying for admission to the Academy, or those who are already enrolled at the Academy, must provide a copy of a student transcript or equivalent official record. They may be asked to provide a copy of the college catalog where the course(s) were taken and the name of the course textbook(s).

In accordance with federal regulations, Third Officer U.S. Coast Guard license students must be in training for a minimum of three years. Accordingly, except in unusual circumstances, transfer students or those expecting advanced placement in those majors must spend a minimum of this time in training.

All transfer students must complete all of their respective departmental degree requirements, and, spend at least their last scheduled academic year at the Academy as full-time students in residence. This does not apply to students in the Maine Maritime Academy/Bath Iron Works apprentice program and the Small Craft Design and Small Vessel Systems programs. In addition, candidates for the USCG Third Officer licenses must complete Cr-303 (Junior Cruise) while enrolled at the Academy, unless this requirement is waived in writing by the appropriate Senior Training Officer and the Academic Dean. A minimum of 50 percent of Business and Logistics credit hours required for the International Business and Logistics academic major must be earned at Maine Maritime Academy.

The following criteria must be met before credits can be transferred:

1. The course(s) must be relevant to the student's major or elective program at Maine Maritime Academy and preferably equivalent to a specific undergraduate course.
2. For a course to be accepted for transfer credit, student performance must be equivalent to a grade of "C" or better from an accredited college or university, or from an approved military program (submit form DD-295, "Application for the Evaluation of Educational Experiences During Military Service").
3. Transfer credits submitted from foreign colleges and universities will only be considered after they have been evaluated by a professional analyst. An Admissions Officer will provide assistance in identifying an analyst, but the student is responsible for all arrangements and related costs.

Credit for any course(s) taken at an accredited college or university may be transferred subject to items 1 and 2. However, these credits are not used in calculating the student's GPA at the Academy, nor can these credits be used to by-pass the minimum residency requirement established by the Academy.

Any transfer of credit situations not covered in this policy will be determined by the Academic Dean in consultation with the appropriate Department Chair.

## Minor Programs and Concentrations

All [Academic Departments](#) at Maine Maritime Academy offer opportunities for specialization in one or more areas of study. Students wishing to receive credit for a specialized program of study should consult with the designated minor or concentration coordinator(s) to receive advice.

### *Minor Guidelines*

A minor program generally consists of 18 credit hours of courses related to a specialized field of study and included on the official list of courses acceptable for that minor. A minimum of 12 of the 18 credit hours must be taken at Maine Maritime Academy. Courses identified for one minor cannot be counted for another minor.

### *Concentration Guidelines*

A concentration generally consists of 18 hours of courses related to a specific field of study within, or extending the student's major program, and included on the official list of courses acceptable for that concentration. A minimum of 12 of the 18 credit hours must be taken at Maine Maritime Academy. Courses identified for one concentration may not be counted toward any other concentration or minor.

### *Grade Requirements*

To qualify for a minor or a concentration, a student must meet all requirements for graduation from Maine Maritime Academy. Students are required to obtain a GPA of at least a 2.0 in the minor or concentration with no more than one grade below a "C".

### **More Than One Minor or Concentration**

Students desiring approval to pursue more than one minor and/or concentration must have approval from advisors in each of the sequences. To receive more than one minor and/or concentration, a student must satisfy all the requirements listed above for each sequence.

See the [Academic Policy](#) section on Maximum Credit Hour Loads for the course overload policy.

Also refer to each [Department's Catalog](#) or web page regarding specialization opportunities within their respective programs of study.

## **Minor/Concentration Requirements**

### Business Minors

#### **Management Track**

Required Courses: Ma-101, Ma-211, Ma-222, Lo-301, and Ma-342 and Any 1 of the following: Ec-102, Ec-201, Lo-313, Lo-334, Lo-411, Lo-422, Lo-432, Ma-242, Ma-303, Ma-312, Ma-332, Ma-403, Ma-421, Ma-422, Ma-470, Ma-498, Et-377, Ms-253, Hc-232, Ns-122, Ns-131, Ns-210, Ns-301, Ns-420, Nv-401, Nv-402, Ym-222, Yo-222.

#### **Logistics Track**

Required Courses: Ma-101, Ma-211, Ma-222, Lo-301, and Lo-313 or Lo-334 and Any 1 of the following: Ec-102, Ec-201, Lo-313 or Lo-334, Lo-411, Lo-422, Lo-432, Ma-242, Ma-303, Ma-312, Ma-332, Ma-342, Ma-403, Ma-421, Ma-422, Ma-470, Ma-498, Et-377, Ms-253, Hc-232, Ns-122, Ns-131, Ns-210, Ns-301, Ns-420, Nv-401, Nv-402, Ym-222, Yo-222.

### Humanities & Social Science

Required Courses: Hc-112 or 211, any Hc course except Hc-111 & Hc-232, and any Hy, Py, Ge, or Po course. \*IBL majors: no courses required of your major may be used for this minor.

### Industrial Powerplant Technology

Required Courses: Et-211 or Es-251, Et-212 or Es-352, Et-498, Et-499 and Any 1 of the following: Et-201, Et-377, Et-202, Et-301, Eg-491, Et-378, Ms-251, Ns-421.  
Optional for a Concentration: Et-401, Et-432, Eg-422; Others with the approval of the advisor.

### Marine Biology

Required Courses: Bi-102, Bi-210, Bi-220 and Any 2 of the following: Bi-201, Bi-218, Bi-301, Bi-306, Bi-308, Bi-312, Bi-320, Bi-322.

### Marine Engineering Operations

Required Courses: Eg-101, Cr-103, Eg-261, Eg-292, Et-371 and 5 credits from the following: Et-101, Et-201, Eg-252, Eg-321, Eg-372, Eg-392, Et-211, Eg-243.

### Marine Transportation Operations

Required Courses: Ns-101 & Ns-241 and 15 credits of Ns-designated courses.

### Mathematics

Required Courses: Ms-252 and Ms-260, plus At least one of the following: Ms-251, Ms-253, Ms-420, Ms-451 and Up to two courses from: computer programming, physics, engineering, math (except calculus courses) approved by minor advisor.

### Naval Architecture

Required Courses: Na-152 or Ns-102 and Ns-301, Et-202 or Es-205, Et-230 or Es-235, Et-201 or Es-245, Na-372, Na-430.

### Naval Science

Required Courses: Pe-100, Nv-101(or Nv-212), Nv-102 (or Eg-101), Nv-211, Nv-301 (or Ns-271 & Ns-272), Nv-302,

Nv-401, Nv-402, Ms-150, Ms-160, Ps-162, Ps-261, Hc-111 and Hc-232 (or Et-452), plus 1 of the following: Nv-202, Hy-200, Nv-310, Po-230 or Po-330 and Also 1 of the following: Ge-200, Ge-210, Hy-210, Hy-220, Po-230 or Po-330.

#### Oceanography

Required Courses: Oc-101 or Os-101, plus

At least two of the following: Oc-210 or Os-309, Os-212, Os-221, Bi-210, Bi-220, or Os-499 and any of the following: Os-204, Os-307, Ch-401, Bi-306, Bi-322, or Os-325.

#### Physical Science

Required Courses: 18 credit hours from the following fields: chemistry, meteorology, ocean studies, or physics. At least 2 courses must be of a sequential nature and the minor advisor must approve inclusion of any course towards this minor.

#### Sail Training Concentration

Required Courses: At least 12 credit hours in the following courses: Pe-200, Ns-344, Cr-214, Ns-341, Ns-321, Pe-401 and Ns-432. Students not enrolled in the SVO major must take at least 6 credit hours in the following courses: Pe-100, Pe-114, Ns-241, Yt-102, Yt-105, Yt-210 and Ns-310.

#### Small Vessel Operations

Required Courses: Ns-101, Ns-262, Ns-271 & Ns-272 plus any three Y- or Ns-designated courses to total not less than 18 credit hours.

#### Technical Science

Required Courses: Et-211 or Es-251 plus

Any 3 to 5 of the following: Et-202 or Es-205, Et-212 or Es-352, Et-220 or Es-420, Et-230 or Es-235, Es-245.

Up to 2 of the following: Ms-120, Ms-160, Ms-251, Ms-252, Cs-150, Cs-220.

The minor advisor may approve other courses.

### Academic Year

The Academy's academic year comprises three sessions: the fall semester extends from September through December, approximately; the spring semester January through April, approximately; and the summer session, May through August, approximately. For exact dates of the Academy's annual calendar, contact the Office of the Registrar or visit [www.mma.edu](http://www.mma.edu).

## Practical Experience

An integral part of all Maine Maritime majors is the practical knowledge that students gain by actual work experience. A major component of all MMA programs is learning by doing. The approach to experiential learning or cooperative education varies from major to major and may include at-sea experience on the *T.S. State of Maine*, Ocean Studies cruises aboard research vessels, SVO training aboard the tug *Pentagoet* and the schooner *Bowdoin*, Power Engineering Technology training in operating power plants, International Business and Logistics experience in businesses, companies and logistics providers, and design engineering experience for Marine Systems Engineering students.

### Guidelines

The following guidelines apply to all MMA students seeking work experience related to their studies:

1. Each cooperative education experience is an academic course. All academic policies of the college that apply to on-campus courses also apply to off-campus practical experience courses.
2. Students planning to co-op must have their practical experience plans approved by the Faculty Co-op Coordinator of their program or their Department Chair prior to registering for the course.
3. Students must register for their practical experience course with the Registrar to receive academic credit.
4. Matriculating students in good academic standing who have satisfactorily completed the required course prerequisites and have the approval of their Faculty Co-op Coordinator or Department Chair are eligible to participate.
5. Students will be considered for practical experience positions with a particular company based upon the employer's specific needs or requirements. In competitive hiring situations, the employer's choice is the final determining employment factor.
6. Students have the responsibility of finding their own housing when employers do not offer it.
7. Maine Maritime Academy is under no obligation to refer or assist students who voluntarily withdraw from consideration or who refuse a job at an approved co-op site.
8. The college and its representatives follow all equal employment opportunity guidelines in assisting students to find appropriate jobs to gain practical experience.
9. A pre-employment drug test through the Academy's Student Health Services will be required of all students before they participate in a co-op experience.

## Marine Practical Training Programs

Candidates for a Third Officer U. S. Coast Guard unlimited license are required to complete the following practical training programs to be eligible for graduation. They must be in training a minimum of three years according to Federal Regulation.

1. Ship Laboratory (maintenance) and watch standing
2. Two cruises aboard the *T.S. State of Maine* (at least 120 days total)
3. The Cadet Shipping Program (minimum of 60 days for engine cadets; minimum of 90 days for deck cadets)
4. The Fire Training Program
5. Lifeboat Training
6. All Regimental requirements
7. All Standards of Training, Certification, and Watchkeeping (STCW) required courses

Students majoring in the five-year Marine Systems Engineering program will be allowed to sit for the license exams, if otherwise eligible, at the end of the first semester of the fourth year of their program.

Federal legislation provides that to be eligible for graduation, state maritime students enrolled in the four-year (and five-year)

unlimited license majors must have passed the examination for Third Mate or Third Assistant Engineer.

### Watch Standing and Ship Laboratory

During non-cruise periods, students in the Regiment are expected to satisfy the watch standing requirements of the Academy. Students are also required to participate in the Ship Laboratory Program to maintain the training vessel and to gain practical shipboard experience.

### Training Ship Cruises

Training cruises aboard the *T.S. State of Maine* are scheduled annually for at least 60 days. Students in majors leading to U.S. Coast Guard Third Assistant Engineer/Third Mate licenses are required to participate in these training cruises during the first and third years. Students in the Marine Systems Engineering (Non-License Track) are required to participate in the training cruise during their first year. Students in non-license majors may elect to do the First Year Cruise (Cr-103) as long as they meet the prerequisites listed in the course description for First Year Cruise, and subject to the [Priority for Registration Policy](#). A U.S. passport and TWIC card are required in order to go on cruises.

For unlimited license students, successful completion of these training cruises, including a sea project and STCW assessments for each cruise, is required for graduation. Four credit hours are awarded for each successfully completed cruise. Cruises aboard the *T.S. State of Maine* are designed to develop practical skills required of a Third Mate or a Third Assistant Engineer. These skills are developed through watch standing, operating and maintaining the ship, and adapting to life aboard. Successful completion of the first-year cruise is a prerequisite to participation in Cadet Shipping in the sophomore year. Failure of the junior-year cruise must be made up at the completion of the senior year. Students who repeat either cruise will be charged for room, board, and cruise fee.

All candidates for the U.S. Coast Guard Third Mate's license are required to demonstrate one year's sea time; Third Assistant Engineers are required to demonstrate 180 days. This time will be met through specialized laboratories, simulation, the two training cruises, and Cadet Shipping.

### US Coast Guard Certifications and License Requirements

Successful completion of the Marine Practical Training Programs and specific courses as prescribed for unlimited license program majors satisfies the prerequisites for U.S. Coast Guard licenses. These include:

- Basic Safety Training
- Basic and Advanced Firefighting Training
- USCG Lifeboat Endorsement
- USCG Radar Observer Certification and ARPA
- FCC and GMDSS Certification
- STCW 95 (Standards of Training Certification and Watch Keeping)

### Cadet Shipping Program

During the summer after the sophomore year, in lieu of a cruise aboard the *T.S. State of Maine*, USCG license students may be assigned to merchant vessels as cadets for further familiarization in shipboard procedures.

In addition to the practical experience gained, students have the opportunity to visit ports of call in the United States and foreign countries. In several cases, students have circumnavigated the globe. Many students find this experience to be a major advantage in finding employment following graduation. In recent years, most students on Cadet Shipping assignments received cadet wage and reimbursement for travel expenses. For engine cadets, a minimum of 60 days is required for this training, which is credited toward the sea service required for an original license in the Merchant Marine. For deck cadets, a minimum of 90 days is required to meet sea-time requirements.

Maine Maritime Academy was the first state maritime academy to incorporate this popular program into its curriculum. It now includes an extensive preparation program aimed at maximizing the learning experience in the real world of shipping. Because of the popularity of the Cadet Shipping program, some of the other state academies have adopted it, with the result being increased competition for available cadet billets. Accordingly, availability of a billet for every student cannot be guaranteed. Any student who does not receive a billet may be assigned to the *T.S. State of Maine* for cadet shipping.

Each student must submit a satisfactory Sea Project, Cadet Shipping Report, Ship's Officer's Evaluation Report, and evidence of sea time to be awarded course credits. Successful completion of the Cadet Shipping program, or sophomore Cadet Shipping on the

*T.S. State of Maine*, is required to be eligible for the junior cruise. Any student failing the Cadet Shipping Program will be required to make up cruise credit by participating in a second Cadet Shipping assignment, if offered, or aboard the Academy training ship.

### Lifeboat Training

In order for a student at Maine Maritime Academy to take the U.S. Coast Guard's written examination for lifeboatman, he/she must have successfully completed the practical rowing, lifeboat operation, and launching part of Ns-101 (Introduction to Nautical Science). Further, it is understood that occasionally students are admitted to our program who have extensive life experience in this field; they may, with the course instructor's recommendation and the Department Chair's approval, be allowed to take the examination without the prerequisites.

### Regimental Requirements

Part of the training requirements imposed by federal legislation is the wearing of uniforms and a demerit discipline system. Successful adherence to these requirements as defined in the Regimental Manual is required for graduation. The mission of the [Regiment](#) is to help prepare men and women for successful careers as officers in the Maritime Service as well as for careers in science, business, and industry by providing them with leadership and management opportunities in a structured training environment.

## The Academic Division

The mission of the Academic Division is to provide career-oriented educational programs that foster professional success.

The Academic Division is made up of six academic departments which function as administrative units for the organization of faculty and curriculum, and four departments providing academic support services. Academic programs are designed and managed by a faculty from diverse academic backgrounds and from industrial positions in engineering, ship operations, marine sciences, maritime management, and small vessel design and operation. The faculty is augmented by part-time personnel plus visiting professors from industry and from domestic and foreign universities. In addition to their teaching assignments, faculty members serve as academic advisors and participate in a variety of academic pursuits such as research and consulting.

## Arts and Sciences

Professors Loomis, Pilot; Associate Professors Anderson, Batt, Bixel (Chair), Gilbert, Hudson, L. Raikes, Sarna, Schaab, Stone, Willmann; Assistant Professors Ciampa, Lorenz, Meadows, Taub; Adjunct Faculty Blackwood, Bourne, Corwin, C. Herrick, G. Herrick, Monberg, Olivari, K. Raikes, Wyman; Emeritus Professors Biggie, Fricke, Mayhew, Merfeld, Mottola.

The mission of the Arts and Sciences Department is to provide the liberal arts component of the students' baccalaureate education while guiding them to:

- think critically and analytically
- write and speak effectively
- understand the global and environmental context of human actions
- develop and apply knowledge of mathematical and scientific reasoning
- develop and communicate sound, informed opinions among conflicting perspectives
- identify problems and to propose solutions
- solve problems as members of a team
- appreciate and respect diversity
- reason and act ethically

The Department of Arts and Sciences offers one major in Interdisciplinary Studies which leads to a Bachelor of Science degree.

Minor programs are offered in the areas of humanities and social science, mathematics, and physical science.

The Department of Arts and Sciences offers courses required of all students and elective courses in various academic disciplines. Courses are offered in the fields of mathematics, computer science, physics, political science, psychology, English composition, literature, management communications, geography, history, humanities, and ship's medicine.

### Interdisciplinary Studies Major

The Interdisciplinary Studies Major offers students the opportunity to earn a Bachelor of Science degree by integrating substantive course material selected from two or three existing majors. This baccalaureate option is designed to attract highly motivated students who wish to coordinate offerings from multiple departments. Potential students selecting this path may be those interested in maritime studies, but who do not intend to be licensed professional mariners, ocean scientists, practicing engineers, or logisticians. Students are likely to be interested in changing careers or enhancing credentials for an existing career. To ensure acceptable standards within the major, students are required to work with an assigned faculty committee from the departments of the selected areas of study.

1. A student electing this major will be required to:
  - a. Apply to MMA and, if accepted, be assigned to the major's coordinator.
  - b. Submit a proposal statement that outlines the academic/career oriented goal and courses of interest that will form the foundation of the curriculum plan.
  - c. Develop a curriculum plan with the faculty advisor who will outline the proposed sequence of courses and prerequisites to meet the degree requirements.
2. Approval of application and admittance to this major will be conducted by a committee consisting of:
  - a. At least two faculty members representing the curriculum areas in the proposed plan.
  - b. A faculty member recommended by the program coordinator and appointed by the Academic Dean to serve as that student's academic advisor.

3. Curriculum requirements include:
  - a. Minimum credit hours for BS degree – 120 credit hours
  - b. General Education, BS minimum requirements (41 credit hours)
    - i. Humanities
    - ii. Social Sciences
    - iii. Math and Natural Sciences
  - d. Curriculum plan that integrates choices from TWO existing majors consisting of introductory to advanced level courses (approximately 34 credit hours in each of two areas, 68 total) OR
  - e. Curriculum plan that integrates choices from THREE existing majors consisting of introductory to advanced level courses (approximately 24 credit hours in each of three areas – 72 total).

## Engineering

Professors Collins, Coté, Haghkerdar, Skaves; Associate Professors Bridge, Fleck, Flood, Kimball, Libby (Chair), Mercer, Reed, Sarnacki, Wlodkowski; Assistant Professors Giffin, Read, Schoof, Trundy; Instructor Mazerall; Teaching Assistants/Technical Support Barton, Markley; Adjunct Faculty Howard, Lowell, Moody, Young; Bath Satellite Campus adjunct faculty Carter, Cinq-Mars, Walker; Emeritus Professors Alexander, C. Herrick, G. Herrick, Small, Spinazola.

A technical person in the early 21st century can expect to work in several distinct careers over the course of a 40-year working life. To prepare our graduates for these careers, engineering programs at Maine Maritime are designed to promote versatility and life-long learning. The mission of the Department of Engineering is to provide the technical content of a range of broad-based majors relating to engineering of marine/mechanical and/or industrial power systems, as well as elective courses open to all Academy students. The Department of Engineering offers coordinated curricula at the Bachelor's degree level in engineering design, engineering technology, and engineering operations on our Castine campus. Classroom studies are closely coordinated with laboratories and practical experience.

The Department of Engineering offers five majors leading to a Bachelor of Science degree and two leading to an Associate of Science degree (available only to employees of General Dynamics Corporation's Bath Iron Works Shipyard in Bath, Maine). Minor programs are offered by this department in the areas of Industrial Powerplant Technology, Marine Engineering Operations, Naval Architecture, and Technical Science.

Each of the baccalaureate programs includes a core program of humanities, mathematics, natural and social sciences, and written and oral communications, providing the student with the broad background necessary for a professional career and future professional growth. Each program includes co-op segments, and some majors, as listed below, require students to be members of the Regiment of Midshipmen. Departmental electives include welding, machine tool operations, electronics, and electrical power, marine and shore-based steam and diesel powerplants, gas turbines, technical and engineering sciences, and technical communications.

### B.S. Majors

- Marine Engineering Operations\*
- Marine Engineering Technology\*
- Marine Systems Engineering (License Track)\*
- Marine Systems Engineering (Non-License Track)\*\*
- Power Engineering Operations
- Power Engineering Technology

\*These three majors lead to a U.S. Coast Guard unlimited license and require participation in the Regiment of Midshipmen. See the catalog section entitled [Student Life](#) for information on the Regiment. Students successfully completing any of the five on-campus major programs receive the Bachelor of Science degree and, if physically qualified, may test for a federal or state license.

\*\*This major requires first-year students to participate in the Regiment of Midshipmen and the first-year cruise.

### A.S. Majors

- Ship Design
- Ship Production

Maine Maritime Academy, in conjunction with Bath Iron Works (BIW), offers an Associate in Science degree via a satellite program

in Bath, Maine, for apprentices of General Dynamics Corporation's BIW Shipyard. The Engineering Department administers this degree program, with majors in either Ship Design or Ship Production. Within the Ship Design major are five areas of concentration: Electrical, Hull Outfit, Heat, Ventilation and Air Conditioning (HVAC), Piping, and Structural. Within the Ship Production major are 12 areas of concentration: Laboratory Technician, Machinist, Maintenance, Maintenance Electrician, Marine Electrician, Nondestructive Test Technician, Outside Machinist, Pipefitter, Ship Carpenter, Structural Fitter, Tinsmith, and Welder. Both academic programs are four years in length and are offered only at our Bath location. Students enrolling in these programs must be employed by Bath Iron Works and meet Maine Maritime Academy entrance requirements; it is possible for a student, once in one of the programs, to continue as an MMA student after terminating employment with the company.

## International Business and Logistics (IBL)

Professors DeWitt (Associate Dean), Potoker; Associate Professors Maier, Schatz; Assistant Professors Jain, Shaughnessy.

The Loeb-Sullivan School of International Business and Logistics offers a Bachelor of Science degree in International Business and Logistics.

The unique IBL undergraduate program blends international business education with contemporary business logistics management skills. Intended primarily for full-time residential students, graduates of the program develop critical thinking, communication, and analytical skills through the building blocks of a liberal arts and humanities curriculum during their matriculation. This is supplemented with courses in core functional areas of business that provide a solid foundation for upper level courses dealing with the complexities of doing business internationally. Specialized courses that deal with the challenges of domestic and global supply chain logistics constitute the uniqueness of the program. Experiential learning, the fundamental ethos of a Maine Maritime Academy education, is a significant component of the program and includes voluntary internships and a mandatory cooperative education program.

The department offers minor programs in the areas of Business Management and Logistics Management. Also available is an attractive 4+1 option whereby a graduating senior from any Maine Maritime Academy undergraduate major may pursue a master's degree during the fifth year in one of the following MS degree programs: Global Supply Chain Logistics, Maritime Management.

## Marine Transportation

Professors Chase (Chair), Eley, Teel; Associate Professors Brandon, Parrott, Pundt; Assistant Professors Cole, Eadie, Slazas; Instructor Miller; Adjunct Faculty Erlanson, Leach, McAvoy, Wade; Emeritus Professor Weeks.

The mission of the Marine Transportation Department is to teach, mentor, train, assess, and nurture the natural curiosity of our students in their quest to become successful professionals in the maritime industry; to provide them with the desire and the skill to improve their knowledge in their chosen field; to help them to be leaders in their field, through academic study, technical knowledge, strong ethics, and hands on hard work so that they leave every vessel, job, company or institution a better place for those who follow; to foster an appreciation of family and community and encourage involvement in each.

The Marine Transportation Department offers two majors at the Bachelor's degree level and three majors at the Associate's degree level:

1. Marine Transportation Operation, BS\*\*. Normally a four year course of study leading to a Bachelor's degree and a Merchant Marine License as Third Mate, Unlimited Tonnage. Participation in the Regiment is a requirement of this degree.
2. Small Vessel Operation, BS\*\*. Normally a four year course of study leading to a Bachelor's degree and a Merchant Marine License as Mate, 500 Ton. Regimental participation is not required.
3. Small Vessel Operation, AS\*\*. Normally a two year course of study leading to an Associate's degree and a Merchant Marine License as Mate, 200 Ton, Near Coastal. Regimental participation is not required.
4. Small Craft Design, AS. A two year collaborative program offered between Maine Maritime Academy and The Landing School of Boatbuilding and Design. Students in the Small Craft Design program must apply and be accepted to both Maine Maritime Academy and The Landing School\*. Students are required to complete one full year in residence at Maine Maritime Academy and a full-immersion 10 month course at The Landing School. The Landing School is located in Kennebunkport, Maine.
5. Small Vessel Systems, AS. A two year collaborative program offered between Maine Maritime Academy and The Landing School of Boatbuilding and Design. Students in the Small Craft Systems program must apply and be accepted to both Maine Maritime Academy and The Landing School\*. Students are required to complete one full year in residence at Maine Maritime Academy and a full-immersion 10 month course at The Landing School. The Landing School is located in Kennebunkport, Maine.

\*The Landing School of Boatbuilding and Design is accredited by the Accrediting Commission of Career Schools &

Colleges of Technology (ACCSCT). The Associate's degree is granted by Maine Maritime Academy.

\*\*Various other certifications as required by national and international regulations are covered in these degrees as well. These majors meet the applicable International Standards for Training, Certification and Watchkeeping (STCW).

Summer sessions are required for all majors in this department. Training cruises and cooperative work experiences are an integral part of a student's education. The college organizes the various summer sessions and assists in all aspects of planning to ensure a successful summer learning experience.

## Marine Transportation Operations and Small Vessel Operations Program Outcomes

MTO and SVO graduates will have the ability to:

1. Understand traditional and modern seamanship skills
2. Safely and correctly apply seamanship skills
3. Understand the topic of terrestrial and celestial navigation
4. Correctly calculate terrestrial and celestial navigation problems
5. Recognize and demonstrate the skills associated with leadership and command
6. Write and speak effectively
7. Demonstrate effective and appropriate problem solving and critical thinking

Minor programs in Marine Transportation Operations and Small Vessel Operations are also offered by this department.

## Naval Science

Faculty: CAPT Buterbaugh (Chair), CDR Stewart, LCDR Johnson, Capt. Troughton, LT Dowell, LTjg Hallett, QM1(SW) Bobier.

Naval and Marine Corps officers are commissioned from Maine Maritime Academy in two categories -- active duty through the [Naval Reserve Officers Training Corps \(NROTC\) program](#) and inactive duty reservists through the [Merchant Marine Reserve \(MMR\) program](#). NROTC program graduates continue on to assignments in Naval Aviation, Surface Warfare, Submarine Warfare, Special Warfare, or the U.S. Marine Corps. The MMR program is designed to ensure the United States has a strong Merchant Marine to serve as a naval auxiliary in time of national emergency. Each of the two commissioning programs has its own academic and military service requirements commensurate with the amount of support and training received. Both programs require completion of certain Naval Science courses which are taught by the active duty officers assigned to the Department of Naval Science. A minor program in Naval Science is offered by this department.

## Ocean Studies

Professors Barlow (Academic Dean), Boucher (Associate Dean), Sahl; Associate Professors Cleveland (Chair), McKenna, Verde; Assistant Professors Harakas, Muhlin.

The Corning School of Ocean Studies provides skills essential to pursuing science-related careers. Our programs of study instill intellectual curiosity, develop critical thinking, inform over multiple scientific disciplines, enhance individual communication abilities, and give direct, meaningful experiences with a range of scientific instruments including those devoted to oceanographic and marine biological research. Our programs integrate scientific instruction with shipboard experiences and training. The department maintains faculty with expertise in the essential areas of marine science and the facilities that enable students to benefit from faculty experience.

The Department of Ocean Studies offers two majors leading to a Bachelor of Science degree: Marine Biology and Marine Science. A minor program in Oceanography and a concentration in Marine Biology are offered by this department.

The Marine Science major prepares students in the field of marine science, with an emphasis on problem solving and decision making in an ocean setting. This broad-based marine science curriculum encompasses the study of chemistry, biology, physics, geology, writing and communications, computer science, mathematics, humanities, and social sciences. Graduates of the program may pursue employment in the various fields of ocean sciences (resource management, aquaculture, research, environmental protection, science education, or oceanography) or graduate education.

The Marine Biology major focuses its training and experiences on the biological component of Ocean Studies. This major provides instruction in essential biology courses (biology, ecology, physiology, cell biology, and genetics) as well as more specialized topics relevant to marine organisms. Graduates of this program may pursue graduate education as well as careers in fisheries, aquaculture, environmental management, consulting, and public education.

Both Marine Science and Marine Biology majors may elect to participate in the Teaching Certification Program, which is offered in collaboration with the College of Education at the University of Maine. This program prepares students to teach science in secondary school. By selecting appropriate electives, students may be certified to teach life or physical sciences.

Participation in the Regiment is optional when enrolled in these programs. Students in non-license majors may elect to participate in First Year Cruise as long as they meet the prerequisites listed in the course description for First Year Cruise, and subject to the [Priority for Registration Policy](#). A passport and TWIC (transportation worker identification credential) card are required to go on cruises.

## Physical Education Requirement

Adjunct Instructors: C. Dagan, K. Dagan, Evans, G. Hassett, Jennings, C. McKenney, Murphy, Sabean, Schroder, Watson.

The Department of Athletics offers a variety of courses in physical education and coaches varsity athletic teams in Men's and Women's Basketball, Men's and Women's Cross Country, Men's Golf, Football, Men's Lacrosse, Men's and Women's Soccer, Softball, and Women's Volleyball.

All full-time undergraduate students who are candidates for the Bachelor of Science degree are required to register for a minimum of two credit hours of physical education, normally during their first year at the Academy. This requirement should be met by taking courses that provide for one credit hour in both the fall and spring semesters. All baccalaureate candidates are required to take at least one swimming-related course. Associate in Science degree candidates are required to register for a sailing and a swimming course. Varsity athletes may satisfy up to 1 credit hour in Physical Education for participating in their sport.

The physical education curriculum consists of a variety of courses focused on developing adult recreational competence, an understanding of physical activity and its contribution to the individual and society, and desirable attitudes toward physical activity, a healthy lifestyle and wellness. Significant emphasis is placed on water activities such as sailing, swimming, skin and scuba diving, and ocean survival.

## Curricula

The following curricula list the required courses of the major programs. To be eligible for graduation, all courses must be either successfully completed at the Academy or completed by transfer from an accredited college, as approved by the Registrar.

### Arts and Sciences Major

- [Interdisciplinary Studies](#)

### Engineering Majors

The Department of Engineering offers six majors leading to a Bachelor of Science degree and two leading to an Associate of Science degree via a satellite program in Bath, Maine, for apprentices of General Dynamics Corporation's Bath Iron Works Shipyard.

- [Marine Engineering Operations](#)
- [Marine Engineering Technology](#)
- [Marine Systems Engineering \(License Track\)](#)
- [Marine Systems Engineering \(Non-License Track\)](#)
- [Power Engineering Operations](#)
- [Power Engineering Technology](#)
- [Ship Design](#)
- [Ship Production](#)

### International Business and Logistics Major

- [International Business and Logistics](#)

### Marine Transportation Majors

The William F. Thompson School of Marine Transportation offers four majors. The Marine Transportation Operations major leads to a Bachelor of Science degree. The Small Vessel Operations major offers both an Associate in Science degree and a Bachelor of Science degree. The Small Craft Design and Small Vessel Systems majors offer an Associate in Science degree, and require students to spend one year at the Castine campus of Maine Maritime Academy and one year in residence at The Landing School of Boat Building and Design in Kennebunkport, Maine.

- [Marine Transportation Operations](#)
- [Small Vessel Operations](#)
  - [Maritime Management and 200 Ton Limited License\\*](#)
- [Small Craft Design](#)
- [Small Vessel Systems](#)

\* A 30 month program is available at the graduate level for qualified applicants intending to pursue the 200 Ton Limited License simultaneously with the M.S. degree in Maritime Management. [Please contact the graduate school for more information.](#)

### Ocean Studies Majors

The Corning School of Ocean Studies offers two majors that lead to a Bachelor of Science Degree.

- [Marine Biology](#)
- [Marine Science](#)

## Interdisciplinary Studies Major

1. A student electing this major will be required to:
  - a. Apply to MMA and, if accepted, be assigned to the Interdisciplinary Studies's coordinator.
  - b. Submit a proposal statement that outlines the academic/career oriented goal and courses of interest that will form the foundation of the curriculum plan.
  - c. Develop a curriculum plan with the faculty advisor who will propose a sequence of courses and prerequisites to meet the degree requirements.
2. Approval of application and admittance to this major will be conducted by a committee consisting of:
  - a. At least two faculty members representing the curriculum areas in the proposed plan.
  - b. A faculty member recommended by the program coordinator and appointed by the Academic Dean to serve as that student's academic advisor.
3. Curriculum requirements include:
  - a. Minimum credit hours for BS degree – 120 credit hours
  - b. General Education, BS minimum requirements (41 credit hours)
    - i. Humanities
    - ii. Social Sciences
    - iii. Math and Natural Sciences
  - c. Curriculum plan that integrates choices from TWO existing majors consisting of introductory to advanced level courses (approximately 34 credit hours in each of two areas, 68 total) OR
  - d. Curriculum plan that integrates choices from THREE existing majors consisting of introductory to advanced level courses (approximately 24 credit hours in each of three areas – 72 total).

The following tables outline the course options for a student in Interdisciplinary Studies.

General Education recommendations:

Composition	3 credit hours
Humanities I, II	6
Hum/SS Electives	9
Lab Science	4
Math to Calc I	4
Computer Science	3
Advanced Writing	3
Physical Education	2
Electives*	
Gen. Ed Subtotal	34
Plus Electives	18 or 14 credit hours*

\*In addition to the general education requirements, students will be required to choose free electives to bring the total credit hours to at least 120. Therefore, in a program that focuses on 2 areas of study, a student needs to take 18 credit hours in electives, and in a program with 3 areas of study, a student needs to take 14 credit hours in electives.

### Interdisciplinary Studies

20+ credit packages (integrates choices from three existing majors)

*International Business & Logistics Options:*

#### A. Logistics Management Package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Lo-301 Business Logistics	3
Lo-313 Freight Transportation	3
Lo-334 Global Purchasing and Material Handling	3
Lo-432 Strategic Supply Chain Management	3
Ma-101 Intro. to Business & Supply Chain Mgmt.	3

Ma-211 Financial Accounting	3
Total credits:	24

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#### B. Business Management Package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Ma-101 Intro. to Business & Supply Chain Mgmt.	3
Ma-211 Financial Accounting	3
Ma-222 Marketing Management	3
Ma-342 International Human Resource Management	3
Ma-403 International Business	3
Ms-253 Statistics for Business and Management	3
Total credits:	24

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#### *Marine Studies Options:*

##### A. Marine Biology Package

Bi-101 Biology I	4
Bi-102 Biology II	4
Bi-201 Ecology	4
Bi-210 Marine Zoology	4
Bi-220 Marine Botany	4
OR	
Bi-322 Marine Ecology	4
OR	
Bi-306 Ichthyology OR any 300 Level Biology Course	4
Os-101 Introduction to Marine Science	4
Total credits:	24

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##### B. Marine Chemistry Package

Ch-210 Chemistry I	4
Ch-220 Chemistry II	4
Ch-310 Introduction to Organic Chemistry	4
Ch-401 Environmental Chemistry	3
Ch-402 Environmental Sampling/Analysis	2
Os-101 Introduction to Marine Science	4
Os-212 Marine Geochemistry	3
Total credits:	24

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##### C. Marine Geology Package

Ch-210 Chemistry I	4
Ch-220 Chemistry II	4
Os-101 Introduction to Marine Science	4
Os-204 Physical Geology	4
Os-211 Marine Geology	4
Os-212 Marine Geochemistry	3
Total credits:	23

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#### *Engineering Options:*

##### A. Marine Engineering Operations

Eg-101 Fundamentals of Engineering Operations	3
Eg-261 Steam Generators	3

Eg-292 Diesel Power I	3
Eg-321 Steam Turbines I	3
Et-211 Thermodynamics I	3
Et-371 Electrical Power I	3
PLUS ANY TWO OF THE FOLLOWING:	
Et-201 Fluid Power	3
Eg-252 Machine Tool Operations I	2.5
Eg-243 Welding	2
Eg-372 Electrical Power II	3
Eg-392 Diesel Power II	3
Eg-431 Gas Turbines	3
Total credits:	22.5-24

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#### B. Industrial Powerplant Technology

Eg-101 Fundamentals of Engineering Operations	3
Et-211 Thermodynamics I	3
OR	
Es-251 Engineering Thermodynamics I	3
Et-202 Statics and Dynamics	4
Et-201 Fluid Power	3
Et-498 PET Capstone I	4
Et-499 PET Capstone II	5
PLUS ANY ONE OF THE FOLLOWING:	
Et-377 Engineering Economics	3
Et-378 Computer Applications for Power	3
Eg-382 Steam Power Systems I	3
Total credits:	25

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#### C. Technical Science

Cs-150 Structured Problem Solving	3
Et-211 Thermodynamics I	3
OR	
Es-251 Engineering Thermodynamics I	3
Et-202 Statics & Dynamics	4
Et-220 Dynamics	3
Et-230 Strength of Materials	3
Et-201 Fluid Power	3
PLUS ANY TWO OF THE FOLLOWING:	
Ns-102 Ships Structure	3
Ns-301 Stability	3
Es-245 Engineering Fluid Mechanics	3
Et-212 Thermodynamics II	3
OR	
Es-352 Engineering Thermodynamics II	3
Et-377 Engineering Economics	3
Total credits:	25

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#### *Marine Transportation Options:*

ANY FOUR OF THE FOLLOWING:	
Ns-101 Introduction to Nautical Science	2
Ns-131 Introduction to Marine Transportation	3
Yt-102 Small Craft Technology	3
Yt-105 Small Craft Construction	3
Ns-122 Cargo I	3
PLUS ANY THREE OF THE FOLLOWING:	
Ns-271 & Ns-272 Terrestrial Navigation I & Lab	4

Ns-262 Navigation Rules I	3
Ns-292 Electronic Navigation	3
Ns-282 Celestial Navigation I	3
Ns-221 Meteorology	3
Ns-382 Celestial Navigation II	3
Ns-461 Casualty Analysis	3
Yt-210 Marine Systems	3
Yt-211 Introduction to Marine Surveying	3
PLUS ANY ONE OF THE FOLLOWING:	
Ns-342 Workboat Operations	3
Ns-345 Shiphandling	3
Ns-341 Auxiliary Sail Vessel Operations	3
Total credits	23-25

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30+ credit packages (integrates choices from two existing majors)

*International Business & Logistics Options:*

A. Logistics Management Package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Lo-301 Business Logistics	3
Lo-313 Freight Transportation	3
Lo-334 Global Purchasing and Material Handling	3
Lo-411 Logistics Information System	3
Lo-422 International Logistics	3
Lo-432 Strategic Supply Chain Management	3
Ma-101 Intro. to Business & Supply Chain Mgmt.	3
Ma-211 Financial Accounting	3
Ma-312 Production and Operations Management	3
Total credits:	33

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B. Business Management package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Ma-101 Intro. to Business & Supply Chain Mgmt.	3
Ma-211 Financial Accounting	3
Ma-222 Marketing Management	3
Ma-242 Managerial Accounting	3
Ma-303 Financial Management	3
Ma-342 International Human Resource Management	3
Ma-403 International Business	3
Ma-422 International Business Law	3
Ms-253 Statistics for Business and Management	3
Total credits:	33

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*Marine Studies Options:*

A. Marine Biology Package

Bi-101 Biology I	4
Bi-102 Biology II	4
Bi-201 Ecology	4
Bi-210 Marine Zoology	4
Ch-210 Chemistry I	4
Ch-220 Chemistry II	4

Os-101 Introduction to Marine Science	4
Bi-322 Marine Ecology	3
OR	
Bi-220 Marine Botany	4
OR	
Bi-306 Ichthyology	4
Total credits:	31-32

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#### B. Marine Chemistry Package

Ch-210 Chemistry I	4
Ch-220 Chemistry II	4
Ch-310 Introduction to Organic Chemistry	4
Ch-401 Environmental Chemistry	3
Ch-402 Environmental Sampling Analysis	3
Os-101 Introduction to Marine Science	4
Os-212 Marine Geochemistry	3
Dept. Elective	4
Dept. Elective	4
Total credits:	33

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#### C. Marine Geology Package

Ch-210 Chemistry I	4
Ch-220 Chemistry II	4
Os-101 Introduction to Marine Science	4
Os-204 Physical Geology	4
Os-211 Marine Geology	3
Os-212 Marine Geochemistry	3
Os-307 Sedimentology	4
Dept. Elective	4
Dept. Elective	3
Total credits:	33

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#### *Engineering Options:*

##### A. Marine Engineering Operations

Eg-101 Fundamentals of Engineering Operations	2
Ps-102 Technical Physics I	4
Et-201 Fluid Power	3
Et-211 Thermodynamics I	3
Eg-243 Welding	2
Eg-252 Machine Tool Operation I	2.5
Eg-261 Steam Generators	3
Eg-292 Diesel Power I	3
Eg-321 Steam Turbines I	3
Et-371 Electrical Power I	3
Eg-392 Diesel Power II	3
Eg-431 Gas Turbines	3
Total credits:	34.5

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##### B. Industrial Powerplant Technology

Eg-101 Fundamentals of Engineering Operations	2
Ps-102 Technical Physics I	4
Et-202 Statics and Dynamics	4
Et-201 Fluid Power	3
Et-211 Thermodynamics I	3

OR	
Es-251 Engineering Thermodynamics I	3
Et-371 Electrical Power I	4
Et-377 Engineering Economics	3
Et-378 Computer Applications for Power	3
Eg-382 Steam Power Systems I	3
Et-498 PET Capstone I	4
Et-499 PET Capstone II	5
Total credits:	38

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C. Technical Science

Ns-102 Ship Structure	3
Cs-150 Structured Problem Solving with Computers	3
Et-201 Fluid Power	3
Et-202 Statics and Dynamics	4
Et-211 Thermodynamics I	3
OR	
Es-251 Engineering Thermodynamics I	3
Et-212 Thermodynamics II	3
OR	
Es-352 Engineering Thermodynamics II	3
Et-220 Dynamics	3
Et-230 Strength of Materials	3
Es-245 Engineering Fluid Mechanics	3
Ns-301 Stability	3
Et-362 Nature and Properties of Materials	3
Et-377 Engineering Economics	3
Total credits:	37

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*Marine Transportation Options:*

ANY FOUR OF THE FOLLOWING:

Ns-101 Introduction to Nautical Science	2
Ns-122 Cargo I	3
Ns-131 Introduction to Marine Transportation	3
Yt-102 Small Craft Technology	3
Yt-105 Small Craft Construction	3

ANY SEVEN OF THE FOLLOWING:

Ns-271 & Ns-272 Terrestrial Navigation I & Lab	4
Ns-221 Meteorology	3
Ns-262 Navigation Rules I	3
Ns-282 Celestial Navigation I	3
Ns-292 Electronic Navigation	3
Ns-382 Celestial Navigation II	3
Ns-461 Casualty Analysis	3
Yt-210 Marine Systems	3
Yt-211 Introduction to Marine Surveying	3

ANY ONE OF THE FOLLOWING:

Ns-301 Stability	3
Ns-341 Auxiliary Sail Vessel Operations	3
Ns-342 Workboat Operations	3
Ns-345 Shiphandling	3

ANY TWO MTO OR SVO MAJOR COURSES NOT OTHERWISE DESCRIBED IN THE PACKAGE LISTED ABOVE.

Total credits:	41-43
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## Marine Engineering Technology

The Marine Engineering Technology program includes all of the practical shipboard work and most of the required courses of the Marine Engineering Operations program with additional required courses in mathematics, writing and communications, and technical sciences. In addition to meeting the college requirement for graduation with at least a 2.0 grade point average for the B.S. degree, graduating students are required to have a minimum grade point average of 2.25 in the MET program core courses. For the MET program, core courses are defined as courses with the prefixes Ce, Cr, Eg, Et, Ms, Na, and Ps. The program provides the graduate with a background for work in many areas of the maritime industry, both at sea and ashore, as well as in non-maritime industries such as public utilities and manufacturing. Successful completion of this major leads to the same degree and licenses as the Operations program, with additional eligibility to sit for the Fundamentals of Engineering Examination. Graduates are employed at sea and ashore throughout the world.

The Objectives of the Marine Engineering Technology major are as follows:

Three to five years after receiving their B.S. from Maine Maritime Academy, typical Marine Engineering Technology graduates are expected to be:

- Versatile engineering technologists with the technical and managerial skills necessary to enter a variety of different careers in the marine engineering technology areas of operations, maintenance, and manufacturing.
- Engineering technologists with competencies in analytical thinking, problem solving, teamwork, communications, and with the ability, and hands-on experience, to apply these skills to support design applications and to solve existing and emerging problems.
- Engineering technologists who recognize the need for, and who have the ability to, remain current in their chosen field. This will include understanding professional ethics, knowledge of contemporary issues, and the pursuit of lifelong learning.

The Outcomes of the Marine Engineering Technology major are as follows:

Students will demonstrate the following through the Marine Engineering Technology program of study at the Academy:

- a. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.
- b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
- c. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes.
- d. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.
- e. An ability to function effectively on teams.
- f. An ability to identify, analyze and solve technical problems.
- g. An ability to communicate effectively.
- h. A recognition of the need for, and an ability to engage in lifelong learning.
- i. An ability to understand professional, ethical and social responsibilities.
- j. A respect for diversity and a knowledge of contemporary professional, societal and global issues.
- k. A commitment to quality, timeliness, and continuous improvement.

The Marine Engineering Technology program is accredited by the Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202, phone: 410-347-7700.

The following table outlines the normal sequence of courses taken by students majoring in Marine Engineering Technology.

### FIRST-YEAR STUDENTS

#### *Fall Semester*

Eg-101	Fundamentals of Engineering Operations	2
Et-101	Graphics	3
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Ns-101	Introduction to Nautical Science	2

Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
Pd-101	Personal Development I	0.5
USCG1	Fire Fighting	
	Total Credits	15.5

Each first-year student must pass Pe-114.

### **Spring Semester**

Cs-150	Structured Problem Solving With Computers	3
Ms-110	Technical Calculus I	4
Na-152	Ship Structure and Stability	3
Ps-102	Technical Physics I	4
Pe	Physical Education	1
Pd-102	Personal Development I	0.5
Mt-12E	Maintenance 4 <sup>th</sup> Class	
	Total Credits	15.5

### **Summer**

Cr-103	First-Year Cruise	4
Mt-13E	Summer Maintenance 4 <sup>th</sup> Class (optional)	

## SOPHOMORES

### **Fall Semester**

Eg-234	Power Equipment Lab	2
Eg-261	Steam Generators I	3
Eg-292	Diesel Power I	3
Et-201	Fluid Power	3
Hc-211	Humanities II	3
Ps-201	Technical Physics II	4
Pd-201	Personal Development II	0.5
Mt-21E	Maintenance 3 <sup>rd</sup> Class	
	Total Credits	18.5

### **Spring Semester**

Eg-243	Welding	2
Eg-252	Machine Tool Operations I	2.5
Eg-392	Diesel Power II	3
Et-211	Thermodynamics I	3
Et-371	Electrical Power I	4
Pd-202	Personal Development II	0.5
	Total Credits	15

### **Summer**

Ce-203	Sophomore Cruise (Cadet Shipping)	4
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## JUNIORS

### *Fall Semester*

Eg-321	Steam Turbines I	3
Eg-351	Machine Tool Operations II	2.5
Eg-372	Electrical Power II	3
Et-212	Thermodynamics II	3
Et-452	Technical Communications	3
	Humanities/Social Science Elective I	3
Pd-301	Personal Development III	
	Total Credits	17.5

### *Spring Semester*

Ch-301	Chemical Principles	4
Eg-382	Steam Power Systems I	3
Et-202	Statics and Dynamics	4
Hc-112	Humanities I	3
Ms-120	Technical Calculus II	4
Pd-302	Personal Development III	
Mt-32E	Maintenance 2 <sup>nd</sup> Class	
	Total Credits	18

### *Summer*

Ce-303	Junior Cruise	4
Mt-33E	Summer Maintenance 2 <sup>nd</sup> Class	

## SENIORS

### *Fall Semester*

Eg-422	Steam Power Systems II	3
Eg-481	Marine Refrigeration and Air Conditioning	2.5
Et-230	Strength of Materials	3
Et-351	Thermo/Fluids Laboratory	2
Et-401	Automation and Control	3
Et-491	Marine Engineering Technology Capstone I	1
	Humanities/Social Science Elective II	3
Pd-401	Personal Development IV	
Mt-41E	Maintenance 1 <sup>st</sup> Class	
	Total Credits	17.5

### *Spring Semester*

Md-310	Basic Shipboard Medicine	3
Et-362	Nature and Properties of Materials	3
Et-432	Power Control Electronics	3

Et-492	Marine Engineering Technology Capstone II	1
	Humanities/Social Science Elective III	3
	Free Elective I (Communication Intensive)	3
Pd-402	Personal Development IV	
	Total Credits	16

Credits Required for Graduation: 145.5

Additional requirements for graduation:

- a. Complete practical training and regimental requirements as published.
- b. Pass both practical and written portions of USCG lifeboatman examination and the USCG Third Assistant Engineer's examination.
- c. Complete sea time requirements as required for the USCG license.
- d. Core classes within the MET Program have STCW competencies within the course, and students are required to achieve a minimum of 70% grade to obtain credit for these competencies.

## Marine Systems Engineering

This major is offered in two tracks: the five year License Track and the four year Non-License Track. In addition to meeting the college requirement for graduation with at least a 2.0 grade point average for the B.S. degree, graduating students are required to have a minimum grade point average of 2.25 in the MSE program core courses. For the MSE program, core courses are defined as courses with the prefixes Ce, Co, Cr, Eg, Et, Es, Ms, Na, and Ps.

The Objectives of the Marine Systems Engineering major are as follows:

Three to five years after receiving a B.S. from Maine Maritime Academy, the typical Marine Systems Engineering License Track graduate is expected to:

- Be competent and confident in his or her professional career and able to freely choose between graduate engineering education and design engineering careers.
- Have demonstrated the professionalism, technical competence and versatility to be moving into positions of technical responsibility.
- Recognize that his or her undergraduate education at Maine Maritime Academy has provided a solid basis for assuming technical responsibilities and opportunities for continued career development.
- Understand the importance of social and ethical responsibilities in his or her engineering career.

The Outcomes of the Marine Systems Engineering major are as follows:

Students will demonstrate the following through the Marine Systems Engineering program of study at the Academy:

- a. An ability to apply knowledge of mathematics, science, and engineering.
- b. An ability to design and conduct experiments, as well as to analyze and interpret data.
- c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety.
- d. An ability to function on multi-disciplinary teams.
- e. An ability to identify, formulate, and solve engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.
- h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- i. A recognition of the need for, and an ability to engage in life-long learning.
- j. A knowledge of contemporary issues.
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Marine Systems Engineering is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202, phone: 410-347-7700.

### Marine Systems Engineering – License Track

The Marine Systems Engineering - License Track program combines many of the technical courses of the Engineering Operations and the Engineering Technology programs with a 10-course calculus-based design and analysis sequence. In addition to the 180 days of industrial practice at sea offered by the other programs, "Systems" also includes a three-to-four month co-op term in a shoreside industrial or government engineering facility.

The complete program takes five years, with the opportunity to sit for the U.S. Coast Guard Third Assistant Engineer's License in the fourth year and for the Fundamentals of Engineering examination at the completion of the first semester of the fifth year. Students in this program may apply for a Bachelor of Science degree with a major in Engineering Operations after four years of study, with automatic eligibility to return to commence the fifth year within a three-year period after graduation. (With this four-year track, Probability and Statistics for Engineering and Science (Ms-251) is not required.)

Successful completion of the 5-year program leads to a Bachelor of Science degree with a major in Marine Systems Engineering - License Track, and prepares the graduate for a career as a sea-going merchant marine engineering officer, or in applied or design

engineering, engineering consulting, or for a management position in maritime, industrial power, or general engineering fields. Graduates of Marine Systems Engineering - License Track are also well prepared to pursue advanced study at graduate school in numerous engineering disciplines.

The program in Marine Systems Engineering - License Track is designed for students with a strong mathematical and analytical ability as well as interest in practical engineering. It is the most academically rigorous course of study at Maine Maritime Academy. Only a few engineering programs in the United States offer a comparable curriculum. The synergy of the 10-course design/analysis sequence with a strong hands-on marine component is the hallmark of the MSE license track.

The following table outlines the normal sequence of courses taken by students majoring in Marine Systems Engineering – License Track:

## FIRST-YEAR STUDENTS

### *Fall Semester*

Cs-151	Introduction to Engineering Programming	3
Eg-101	Fundamentals of Engineering Operations	2
Es-180	Engineering Design I	2
Hc-111	Composition	3
Ms-150	Calculus I	4
Ns-101	Introduction to Nautical Science	2
Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
Pd-101	Personal Development I	0.5
USCG1	Fire Fighting	
	Total Credits	17.5

Each first-year student must pass Pe-114.

### *Spring Semester*

Ch-352	Engineering Chemistry	4
Eg-243	Welding	2
Et-101	Graphics	3
Ms-160	Calculus II	4
Ps-162	Physics I	4
Pe	Physical Education	1
Pd-102	Personal Development I	0.5
Mt-12E	Maintenance 4 <sup>th</sup> Class	
	Total Credits	18.5

### *Summer*

Cr-103	First-Year Cruise	4
Mt-13E	Summer Maintenance 4 <sup>th</sup> Class (optional)	

## SOPHOMORES

### *Fall Semester*

Eg-265	Steam Generating Systems	2
Eg-292	Diesel Power I	3

Es-205	Engineering Statics	3
Es-251	Engineering Thermodynamics I	3
Et-201	Fluid Power	3
Ps-261	Physics II	4
Pd-201	Personal Development II	0.5
Mt-21E	Maintenance 3 <sup>rd</sup> Class	
	Total Credits	18.5

### **Spring Semester**

Eg-234	Power Equipment Lab	2
Eg-252	Machine Tool Operations I	2.5
Eg-392	Diesel Power II	3
Es-352	Engineering Thermodynamics II	3
Es-371	Enhanced Electrical Power I	4
Ms-252	Engineering Mathematics I	4
Pd-202	Personal Development II	0.5
	Total Credits	19

### **Summer**

Ce-203	Sophomore Cruise (Cadet Shipping)	4
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## **JUNIORS**

### **Fall Semester**

Eg-321	Steam Turbines I	3
Eg-372	Electrical Power II	3
Hc-211	Humanities II	3
Ms-260	Differential Equations	3
Oc-101	Introduction to Ocean Science	3
Pd-301	Personal Development III	
	Total Credits	15

### **Spring Semester**

Eg-382	Steam Power Systems I	3
Es-235	Engineering Strength of Materials	3
Es-245	Engineering Fluid Mechanics	3
Es-490	Numerical and Computer Methods for Engineering	3
Et-452	Technical Communications	3
Hc-112	Humanities I	3
Pd-302	Personal Development III	
Mt-32E	Maintenance 2 <sup>nd</sup> Class	
	Total Credits	18

### **Summer**

Ce-303	Junior Cruise	4
Mt-33E	Summer Maintenance 2 <sup>nd</sup> Class	

## SENIORS

### *Fall Semester*

Eg-481	Marine Refrigeration and Air Conditioning	2.5
Es-420	Engineering Dynamics	3
Et-401	Automation and Control	3
Md-310	Basic Shipboard Medicine	3
Ms-251	Probability and Statistics for Engineering and Science	3
	Humanities Elective	3
Pd-401	Personal Development IV	
Mt-41E	Maintenance 1 <sup>st</sup> Class	
	Total Credits	17.5

### *Spring Semester*

Eg-422	Steam Power Systems II	3
Es-380	Engineering Design II	3
Et-377	Engineering Economics	3
Na-372	Naval Architecture I	3
	Social Science Elective	3
Pd-402	Personal Development IV	
	Total Credits	15

### *Summer*

Co-400	Cooperative Industrial Field Experience	1.5
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## FIFTH YEAR

### *Fall Semester*

Cs	Programming Elective	3
Es-430	Machine Design	3
Es-501	Engineering Materials	3
Es-598	Capstone Design Preparation	1
Ms-451	Engineering Mathematics II	3
	Total Credits	13

### *Spring Semester*

Es-510	Engineering Test Laboratory	2
Es-599	Capstone Design Project	3
Et-432	Power Control Electronics	3
	Humanities/Social Science Elective I	3
	Free Elective I	1-3
	Total Credits	12-14

Credits Required for Graduation: 177.5-179.5

Additional requirements for graduation:

- a. Complete practical training and regimental requirements as published.
- b. Pass both practical and written portions of USCG lifeboatman examination and the USCG Third Assistant Engineer's examination.
- c. Complete sea time requirements as required for the USCG license.
- d. Core classes within the MSE Program have STCW competencies within the course, and students are required to achieve a minimum of 70% grade to obtain credit for these competencies.

### Marine Systems Engineering – Non-License Track

The Non-License Track of Marine Systems Engineering is a four-year Bachelor of Science program including all the humanities, math, science, and engineering analysis and design courses of the 5-year Marine Systems Engineering program, but without many of the engineering operations courses required by the 5-year program. It does not lead to eligibility to sit for the USCG Third Assistant Engineer's license. Membership in the Regiment of Midshipmen for first-year students only and participation in the first-year cruise are required.

The MSE Non-License Track program is one of the more academically rigorous courses of study at Maine Maritime Academy. Comparable to the mechanical engineering curricula of other institutions, MSE Non-License Track is distinguished by its grounding in marine applications and naval architecture.

Successful completion of the 4-year program leads to a Bachelor of Science degree in Marine Systems Engineering – Non License Track, and prepares the graduate for careers in engineering design, consulting, or management in maritime, industrial power, or general engineering fields. Graduates of this non-license track are also well prepared to pursue advanced study at graduate school in numerous engineering disciplines.

The following table outlines the normal sequence of courses taken by students majoring in Marine Systems Engineering – Non-License Track:

#### FIRST-YEAR STUDENTS

##### *Fall Semester*

Cs-151	Introduction to Engineering Programming	3
Eg-101	Fundamentals of Engineering Operations	2
Es-180	Engineering Design I	2
Hc-111	Composition	3
Ms-150	Calculus I	4
Ns-101	Introduction to Nautical Science	2
Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
Pd-101	Personal Development I	0.5
USCG1	Fire Fighting	
	Total Credits	17.5

Each first-year student must pass Pe-114.

##### *Spring Semester*

Ch-352	Engineering Chemistry	4
Eg-243	Welding	2

Et-101	Graphics	3
Ms-160	Calculus II	4
Ps-162	Physics I	4
Pe	Physical Education	1
Pd-102	Personal Development I	0.5
Mt-12E	Maintenance 4 <sup>th</sup> Class	
	Total Credits	18.5

### **Summer**

Cr-103	First-Year Cruise	4
Mt-13E	Summer Maintenance 4 <sup>th</sup> Class (optional)	

## SOPHOMORES

### **Fall Semester**

Es-205	Engineering Statics	3
Es-251	Engineering Thermodynamics I	3
Et-201	Fluid Power	3
Ms-251	Probability and Statistics for Engineering and Science	3
Ps-261	Physics II	4
	Total Credits	16

### **Spring Semester**

Es-235	Engineering Strength of Materials	3
Es-352	Engineering Thermodynamics II	3
Es-371	Enhanced Electrical Power I	4
Hc-112	Humanities I	3
Ms-252	Engineering Mathematics I	4
	Total Credits	17

### **Summer**

Co-203	Industrial Co-op	1.5-2
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## JUNIORS

### **Fall Semester**

Cs	Programming Elective	3
Es-501	Engineering Materials	3
Hc-211	Humanities II	3
Ms-260	Differential Equations	3
Oc-101	Introduction to Ocean Science	3
	Technical Elective	2-3
	Total Credits	17-18

### **Spring Semester**

Es-245	Engineering Fluid Mechanics	3
Es-380	Engineering Design II	3
Es-490	Numerical and Computer Methods for Engineering	3
Et-452	Technical Communications	3
Na-372	Naval Architecture I	3
	Technical Elective	2-3
	Total Credits	17-18

### **Summer**

Co-400	Cooperative Industrial Field Experience	1.5-2
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## SENIORS

### **Fall Semester**

Es-420	Engineering Dynamics	3
Es-430	Machine Design	3
Es-598	Capstone Design Preparation	1
Et-401	Automation and Control	3
Ms-451	Engineering Mathematics II	3
Na-430	Naval Architecture II	3
	Social Science Elective	3
	Total Credits	19

### **Spring Semester**

Es-510	Engineering Test Laboratory	2
Es-599	Capstone Design Project	3
Et-377	Engineering Economics	3
Et-432	Power Control Electronics	3
	Humanities Elective	3
	Humanities/Social Science Elective I	3
	Total Credits	17

Credits Required for Graduation: 146-149

## Power Engineering Operations

The Power Engineering Operations program is concerned primarily with the operation and maintenance of industrial steam and gas turbine power plants and with related electrical systems. Classroom studies are closely coordinated with practical experience in laboratories. Successful completion of the program leads to the Bachelor of Science degree and, after passing a State of Maine examination, a 4<sup>th</sup>-Class Stationary Engineer's license. In addition to meeting the college requirement for graduation with at least a 2.0 grade point average for the B.S. degree, graduating students are required to have a minimum grade point average of 2.25 in the PEO program core courses. For the PEO program, core courses are defined as courses with the prefixes Co, Eg, Et, Ms, and Ps. Students majoring in this program may enroll in any of the minor programs offered at the college. Graduates are employed by power generation and energy production companies.

The following table outlines the normal sequence of courses taken by students majoring in Power Engineering Operations:

Note that this program accepted its first students in the Fall 2008 Semester and the first graduates will complete the program no earlier than 2012.

### FIRST-YEAR STUDENTS

#### *Fall Semester*

Cs-150	Structured Problem Solving With Computers	3
Eg-101	Fundamentals of Engineering Operations	2
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Pe	Physical Education	1
USCG1	Fire Fighting	
	Total Credits	13

Each first-year student must pass a swim-based PE Class.

#### *Spring Semester*

Et-101	Graphics	3
Hc-112	Humanities I	3
Ms-110	Technical Calculus I	4
Ps-102	Technical Physics I	4
Pe	Physical Education	1
Mt-12E	Maintenance First Year	
	Fire Fighting	
	Total Credits	15

### SOPHOMORES

#### *Fall Semester*

Eg-243	Welding	2
Eg-261	Steam Generators I	3
Eg-292	Diesel Power I	3
Et-201	Fluid Power	3
Hc-211	Humanities II	3
Ps-201	Technical Physics II	4

Total Credits	18
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### **Spring Semester**

Eg-234	Power Equipment Lab	2
Eg-252	Machine Tool Operations I	2.5
Et-211	Thermodynamics I	3
Et-371	Electrical Power I	4
Et-452	Technical Communications	3
	Social Science Elective	3
	Total Credits	17.5

### **Summer**

Co-201	PEO Cooperative Industrial Field Experience I	2
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## JUNIORS

### **Fall Semester**

Eg-321	Steam Turbines I	3
Eg-351	Machine Tool Operations II	2.5
Eg-372	Electrical Power II	3
	Free Elective I	3
	Humanities/Social Science Elective I	3
	Total Credits	14.5

### **Spring Semester**

Ch-301	Chemical Principles	4
Eg-382	Steam Power Systems I	3
Eg-392	Diesel Power II	3
Eg-431	Gas Turbines	2
	Free Elective II	3
	Total Credits	15

### **Summer**

Co-301	PEO Cooperative Industrial Field Experience II	2
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## SENIORS

### **Fall Semester**

Eg-491	Diesel Power III	3
Eg-497	Power Engineering Operations Capstone I	4
Et-401	Automation and Control	3
	Free Elective III	3
	Humanities/Social Science Elective II	3
	Total Credits	16

## *Spring Semester*

Eg-498	Power Engineering Operations Capstone II	4
Et-377	Engineering Economics	3
Et-482	Heating, Ventilation, & Air Conditioning	2
	Free Elective IV	3
	Technical Elective	1-3
	Total Credits	13-15

Credits Required for Graduation: 126 -128

Additional requirement for graduation:

Complete all requirements for and pass the State of Maine Fourth Class Stationary Engineer License Exam.

## Power Engineering Technology

The Power Engineering Technology major is based on the body of knowledge inherent in Marine Engineering Operations, but it is oriented toward the shore-side power industry rather than marine power plants. It also includes additional studies in writing and communications, mathematics, and technical sciences. In addition to meeting the college requirement for graduation with at least a 2.0 grade point average for the B.S. degree, graduating students are required to have a minimum grade point average of 2.25 in the PET program core courses. For the PET program, core courses are defined as courses with the prefixes Ch, Co, Eg, Et, Ms, and Ps. Students are required to participate in approved industrial co-op programs in shore-side power plants. Participation in the Regiment is optional when enrolled in this program. However, students electing to participate in First Year Cruise (Cr-103) must have been in the Regiment for the year and meet the following prerequisites: 4/C Maintenance; Ship's Orientation, Ocean Survival (Pe-114); Fire Training, and Ns-101.

Successful completion of this major leads to the Bachelor of Science degree. Graduates are eligible to sit for the State of Maine Third Class Engineer (stationary plant engineer) license, and the Fundamentals of Engineering Examination. Graduates are employed in power generation and related industries throughout the United States of America.

The Objectives of the Power Engineering Technology major are as follows:

Three to five years after receiving their B.S. from Maine Maritime Academy, typical Power Engineering Technology graduates are expected to be:

- Versatile engineering technologists with competencies in existing and emerging power production technologies, analytical thinking, problem solving, teamwork, communications, and with the ability, and hands-on experience, to apply these skills to solve existing and emerging problems and to evaluate, maintain, and develop energy conversion systems.
- Engineering technologists who recognize the need, and who have the ability, to remain current in their chosen field. This will include understanding professional ethics, knowledge of contemporary issues, and the pursuit of lifelong learning.

The Outcomes of the Power Engineering Technology major are as follows:

Students will demonstrate the following through the Power Engineering Technology program of study at MMA:

- a. Mastery of the knowledge, techniques, skills and modern tools of the power industry.
- b. Ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
- c. Design and conduct experiments and analyze and interpret data.
- d. Support the design of a system, component, or process to meet desired needs.
- e. Function effectively on teams.
- f. Ability to identify, analyze and solve technical problems.
- g. Communicate effectively through oral, written, visual, and graphical methods.
- h. Recognize the need for self-improvement through continuing education and lifelong learning.
- i. Ability to understand professional, ethical and social responsibilities.
- j. Respect for diversity and a knowledge of contemporary professional, societal and global issues.
- k. Commitment to quality, timeliness, and continuous improvement.

The Power Engineering Technology program is accredited by the Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202, phone: 410-347-7700.

The following table outlines the normal sequence of courses taken by students majoring in Power Engineering Technology.

### FIRST-YEAR STUDENTS

#### **Fall Semester**

Cs-150	Structured Problem Solving Using Computers	3
Eg-101	Fundamentals of Engineering Operations	2
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Pe	Physical Education	1
	Humanities/Social Science Elective I	3

Each first-year student must pass one of Pe-102, 103, 113 or 114.

### **Spring Semester**

Eg-234	Power Equipment Lab	2
Eg-242	Machine Tool Practice	1
Et-101	Graphics	3
Hc-112	Humanities I	3
Ms-110	Technical Calculus I	4
Ps-102	Technical Physics I	4
Pe	Physical Education	1
	Total Credits	18

## SOPHOMORES

### **Fall Semester**

Eg-261	Steam Generators I	3
Et-201	Fluid Power	3
Et-202	Statics and Dynamics	4
Ps-201	Technical Physics II	4
	Humanities/Social Science Elective II	3
	Total Credits	17

### **Spring Semester**

Eg-243	Welding	2
Et-211	Thermodynamics I	3
Et-230	Strength of Materials	3
Et-371	Electric Power I	4
Et-452	Technical Communications	3
Hc-211	Humanities II	3
	Total Credits	18

### **Summer**

Co-200	Cooperative Industrial Field Experience I	2
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## JUNIORS

### **Fall Semester**

Eg-292	Diesel Power I	3
Eg-321	Steam Turbines I	3
Eg-372	Electrical Power II	3
Et-212	Thermodynamics II	3
Ms-120	Technical Calculus II	4
	Total Credits	16

### **Spring Semester**

Ch-301	Chemical Principles	4
Eg-382	Steam Power Systems I	3
Eg-431	Gas Turbines	3
Et-378	Computer Applications for Power	3
Et-432	Power Control Electronics	3
	Total Credits	16

**Summer**

Co-300 Cooperative Industrial Field Experience II 2

**SENIORS**

**Fall Semester**

Et-351 Thermo/Fluids Lab 2  
Et-401 Automation and Control 3  
Et-498 PET Capstone I 4  
Humanities/Social Science Elective III 3  
Free Elective I 1-3  
Total Credits 13-15

**Spring Semester**

Et-362 Materials 3  
Et-377 Engineering Economics 3  
Et-482 Heating, Ventilation, & Air Conditioning 2  
Et-499 PET Capstone II 5  
Free Elective II 1-3  
Total Credits 14-16

Credits Required for Graduation: 132 - 136

## MAINE MARITIME ACADEMY/BATH IRON WORKS

### SHIP DESIGN AND SHIP PRODUCTION

Note: The Bath Iron Works Apprentice Program in Ship Design and Ship Production is offered only in Bath, Maine. Not all Student Life Services on the Castine campus are available in Bath, Maine.

The objective of the BIW apprenticeship is to train highly skilled, versatile, and educated mechanics and designers through both classroom instruction and hands-on experience. The program strives to develop proficiency and knowledge in:

- Engineering principles and problem-solving techniques
- Organizational, communication, and leadership skills
- Trade or discipline-based skills and safe work practices

Successful completion of this program leads to the Associate in Science degree.

### CURRICULUM BY CONCENTRATION/DEGREE

#### Ship Design Majors

#### SHIP DESIGN - Electrical Concentration

Course Number	Course Name	Credits
CS201	Introduction to Computing	2
EC102	Principles of Economics	3
EG102	Intro to Marine Engineering	2
EG120	Mechanical Drawing I	3
EG218	Electrical Shop Methods	1
EG280	Basic Electricity	2
EG281	Electricity II	3
EG282	Electricity III	1
EG283	Electricity IV	3
ET280	Fundamentals of Marine Design I	2
ET282	Design Practices	2
ET380	Fundamentals of Marine Design II	2
ET200	Basic Electronics	2
ET207	Electronics II	2
ET208	Electronics III	3
ET209	Electronics IV	3
HC110	Business Communications	3
HC113	Oral Communication Skills	3
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

#### SHIP DESIGN - Hull Outfit Concentration

Course Number	Course Name	Credits
CS201	Introduction to Computing	2
EC102	Principles of Economics	3
EG102	Intro to Marine Engineering	2

EG120	Mechanical Drawing I	3
EG250	Mechanical Drawing II	3
EG216	Sheet Metal Methods	1
ET206	Mechanics I	3
ET306	Mechanics II	2
ET230	Strength of Materials	3
ET235	Material Properties and Testing I	3
ET280	Fundamentals of Marine Design I	2
ET282	Design Practices	2
ET380	Fundamentals of Marine Design II	2
HC110	Business Communications	3
HC113	Oral Communication Skills	3
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

### SHIP DESIGN - HVAC Concentration

Course Number	Course Name	Credits
CS201	Introduction to Computing	2
EC102	Principles of Economics	3
EG102	Intro to Marine Engineering	2
EG120	Mechanical Drawing I	3
EG250	Mechanical Drawing II	3
EG216	Sheet Metal Methods	1
ET206	Mechanics I	3
ET306	Mechanics II	2
ET230	Strength of Materials	3
ET235	Material Properties and Testing I	3
ET280	Fundamentals of Marine Design I	2
ET282	Design Practices	2
ET380	Fundamentals of Marine Design II	2
HC110	Business Communications	3
HC113	Oral Communication Skills	3
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

### SHIP DESIGN - Piping Concentration

Course Number	Course Name	Credits
CS201	Introduction to Computing	2
EC102	Principles of Economics	3
EG102	Intro to Marine Engineering	2
EG120	Mechanical Drawing I	3
EG250	Mechanical Drawing II	3
EG217	Pipefitting Methods	1
ET206	Mechanics I	3
ET306	Mechanics II	2
ET230	Strength of Materials	3

ET235	Material Properties and Testing I	3
ET280	Fundamentals of Marine Design I	2
ET282	Design Practices	2
ET380	Fundamentals of Marine Design II	2
HC110	Business Communications	3
HC113	Oral Communication Skills	3
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

### SHIP DESIGN - Structural Concentration

Course Number	Course Name	Credits
CS201	Introduction to Computing	2
EC102	Principles of Economics	3
EG102	Intro to Marine Engineering	2
EG120	Mechanical Drawing I	3
EG250	Mechanical Drawing II	3
ET206	Mechanics I	3
ET306	Mechanics II	2
ET230	Strength of Materials	3
ET235	Material Properties and Testing I	3
ET280	Fundamentals of Marine Design I	2
ET282	Design Practices	2
ET380	Fundamentals of Marine Design II	2
HC110	Business Communications	3
HC113	Oral Communication Skills	3
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA150	Mold Lofting	1
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

## MAINE MARITIME ACADEMY/BATH IRON WORKS

### SHIP PRODUCTION

The Bath Iron Works (BIW) Apprentices Program in Ship Production is offered only in Bath, Maine. Not all Student Life services on the Castine campus are available in Bath, Maine.

The objective of the BIW apprenticeship is to train highly skilled, versatile, and educated mechanics and designers through both classroom instruction and hands-on experience. The program strives to develop proficiency and knowledge in:

- Engineering principles and problem-solving techniques
- Organizational, communication, and leadership skills
- Trade or discipline-based skills and safe work practices

Successful completion of this program leads to the Associate in Science degree.

### CURRICULUM BY CONCENTRATION/DEGREE

#### Ship Production Majors

#### SHIP PRODUCTION – Laboratory Technician Concentration

Course Number	Course Name		Credits
CH101	Chemistry	3	
CH102	Chemistry Lab	1	
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG102	Introduction to Marine Engineering	2	
EG120	Mechanical Drawing I	3	
EG280	Basic Electricity	2	
EG202	Confined Space Safety	1	
ET206	Mechanics I	3	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	
ET236	Material Properties and Testing II	1	
HC110	Business Communications	3	
HC113	Oral Communications Skills	3	
MA230	Organizational Behavior	3	
MS105	Mathematics I	3	
MS205	Mathematics II	3	
NA151	Ship Building Process	3	
PS103	Physics I	3	
PS203	Physics II	3	
OJT	On the Job Training	12	

#### SHIP PRODUCTION - Machinist Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG102	Introduction to Marine Engineering	2	
EG120	Mechanical Drawing I	3	
EG255	Machine Shop Theory I	3	
EG355	Machine Shop Theory II	2	
ET206	Mechanics I	3	
ET306	Mechanics II	2	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	
HC110	Business Communications	3	
HC113	Oral Communications Skills	3	
MA200	Labor History	2	
MA230	Organizational Behavior	3	

MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

SHIP PRODUCTION - Maintenance Concentration  
(Includes Maintenance Carpenter, Mechanic, and Pipefitting)

Course Number	Course Name	Credits
CS201	Introduction to Computing	2
EC102	Principles of Economics	3
EG120	Mechanical Drawing I	3
EG250	Mechanical Drawing II	3
ET206	Mechanics I	3
ET306	Mechanics II	2
ET230	Strength of Materials	3
ET235	Material Properties and Testing I	3
HC110	Business Communications	3
HC113	Oral Communications Skills	3
MA200	Labor History	2
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

SHIP PRODUCTION - Maintenance Electrician Concentration  
(Includes Maintenance HVAC)

Course Number	Course Name	Credits
CS201	Introduction to Computing	2
EC102	Principles of Economics	3
EG120	Mechanical Drawing I	3
EG280	Basic Electricity	2
EG281	Electricity II	3
EG282	Electricity III	1
EG283	Electricity IV	3
ET200	Basic Electronics	2
ET207	Electronics II	2
ET208	Electronics III	3
ET209	Electronics IV	3
ET235	Material Properties and Testing I	3
HC110	Business Communications	3
HC113	Oral Communications Skills	3
MA200	Labor History	2
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

SHIP PRODUCTION - Marine Electrician Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG120	Mechanical Drawing I	3	
EG218	Electrical Methods	1	
EG280	Basic Electricity	2	
EG281	Electricity II	3	
EG282	Electricity III	1	
EG283	Electricity IV	3	
ET200	Basic Electronics	2	
ET207	Electronics II	2	
ET208	Electronics III	3	
ET209	Electronics IV	3	
ET235	Material Properties and Testing I	3	
HC110	Business Communications	3	
HC113	Oral Communications Skills	3	
MA200	Labor History	2	
MA230	Organizational Behavior	3	
MS105	Mathematics I	3	
MS205	Mathematics II	3	
NA151	Ship Building Process	3	
PS103	Physics I	3	
PS203	Physics II	3	
OJT	On the Job Training	12	

#### SHIP PRODUCTION - Nondestructive Test Technician Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computers	2	
EC102	Economics	3	
EG103	Introduction to Nondestructive Examination Methods	1	
EG105	Liquid Penetrant and Magnetic Particle Methods	1	
EG120	Mechanical Drawing I	3	
EG201	Ultrasonic Test Methods	2	
EG203	Radiographic Test Methods	2	
EG215	Blueprint Reading Methods	1	
EG240	Welding Technology	1	
EG241	Welding Symbols	1	
ET206	Mechanics I	3	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	
ET236	Material Properties and Testing II	1	
HC110	Business Communication	3	
HC113	Oral Communication	3	
MA230	Organizational Behavior	3	
MS105	Mathematics I	3	
MS205	Mathematics II	3	
NA151	Shipbuilding Process	3	
PS103	Physics I	3	
PS203	Physics II	3	
OJT	On the Job Training	12	

#### SHIP PRODUCTION - Outside Machinist Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG102	Introduction to Marine Engineering	2	
EG120	Mechanical Drawing I	3	
EG219	Outside Machinist Methods	1	
ET206	Mechanics I	3	

ET306	Mechanics II	2
ET230	Strength of Materials	3
ET235	Material Properties and Testing I	3
HC110	Business Communications	3
HC113	Oral Communications Skills	3
MA200	Labor History	2
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

#### SHIP PRODUCTION - Pipefitter Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG102	Introduction to Marine Engineering	2	
EG120	Mechanical Drawing I	3	
EG250	Mechanical Drawing II	3	
EG217	Pipefitting Methods	1	
ET206	Mechanics I	3	
ET306	Mechanics II	2	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	
HC110	Business Communications	3	
HC113	Oral Communications Skills	3	
MA200	Labor History	2	
MA230	Organizational Behavior	3	
MS105	Mathematics I	3	
MS205	Mathematics II	3	
NA151	Ship Building Process	3	
PS103	Physics I	3	
PS203	Physics II	3	
OJT	On the Job Training	12	

#### SHIP PRODUCTION - Ship Carpenter Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG120	Mechanical Drawing I	3	
EG250	Mechanical Drawing II	3	
ET206	Mechanics I	3	
ET306	Mechanics II	2	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	
HC110	Business Communications	3	
HC113	Oral Communications Skills	3	
MA200	Labor History	2	
MA230	Organizational Behavior	3	
MS105	Mathematics I	3	
MS205	Mathematics II	3	
NA151	Ship Building Process	3	
PS103	Physics I	3	
PS203	Physics II	3	
OJT	On the Job Training	12	

#### SHIP PRODUCTION - Structural Fitter Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG120	Mechanical Drawing I	3	
EG250	Mechanical Drawing II	3	
EG215	Blueprint Reading Methods	1	
EG241	Welding Symbols	1	
ET206	Mechanics I	3	
ET306	Mechanics II	2	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	
ET236	Material Properties and Testing II	1	
HC110	Business Communications	3	
HC113	Oral Communications Skills	3	
MA200	Labor History	2	
MA230	Organizational Behavior	3	
MS105	Mathematics I	3	
MS205	Mathematics II	3	
NA150	Mold Lofting	1	
NA151	Ship Building Process	3	
PS103	Physics I	3	
PS203	Physics II	3	
OJT	On the Job Training	12	

#### SHIP PRODUCTION - Tinsmith Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG120	Mechanical Drawing I	3	
EG250	Mechanical Drawing II	3	
EG216	Sheet Metal Methods	1	
ET206	Mechanics I	3	
ET306	Mechanics II	2	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	
HC110	Business Communications	3	
HC113	Oral Communications Skills	3	
MA200	Labor History	2	
MA230	Organizational Behavior	3	
MS105	Mathematics I	3	
MS205	Mathematics II	3	
NA151	Ship Building Process	3	
PS103	Physics I	3	
PS203	Physics II	3	
OJT	On the Job Training	12	

#### SHIP PRODUCTION - Welder Concentration

Course Number	Course Name		Credits
CS201	Introduction to Computing	2	
EC102	Principles of Economics	3	
EG215	Blueprint Reading Methods	1	
EG120	Mechanical Drawing I	3	
EG240	Welding Technology	1	
EG241	Welding Symbols	1	
ET206	Mechanics I	3	
ET306	Mechanics II	2	
ET230	Strength of Materials	3	
ET235	Material Properties and Testing I	3	

ET236	Material Properties and Testing II	1
HC110	Business Communications	3
HC113	Oral Communications Skills	3
MA200	Labor History	2
MA230	Organizational Behavior	3
MS105	Mathematics I	3
MS205	Mathematics II	3
NA151	Ship Building Process	3
PS103	Physics I	3
PS203	Physics II	3
OJT	On the Job Training	12

## International Business and Logistics

The Loeb-Sullivan School of International Business and Logistics undergraduate program blends international business education with contemporary business logistics management skills. Intended primarily for full-time residential students, graduates of the program develop critical thinking, communication and analytical skills. Courses in core functional areas of business provide a solid foundation for upper level courses dealing with the complexities of doing business internationally. Specialized courses that deal with the challenges of domestic and global supply chain management constitute the uniqueness of the program. Experiential learning, the fundamental ethos of a Maine Maritime Academy education, is a significant component of the program and includes voluntary internships and a mandatory cooperative education program. The IBL department offers minor programs in the areas of Business Management and Logistics Management.

The sequence of courses for the Bachelor of Science degree in International and Business Logistics is as follows:

### FIRST-YEAR STUDENTS

#### *Fall Semester*

Cs-150	Structured Problem Solving With Computers	3
Ec-102	Microeconomics	3
Hc-111	Composition	3
Ma-101	Introduction to Business & Supply Chain Management	3
Ms-141	Finite Mathematics	4
Pe	Physical Education	1
	Total Credits	17

#### *Spring Semester*

Ec-103	Macroeconomics	3
Ge-200 or Po-230	World Regional Geography I or Contemporary World Politics I	3
Hc-112	Humanities I	3
Ma-111	Financial Accounting	3
Ms-151	Business Calculus	4
Pe	Physical Education	1
	Total Credits	17

### SOPHOMORES

#### *Fall Semester*

Ch-301/Ps-102/ Ps-162/Oc-101	Lab Science Elective	3-4
Ge-200 or Po-230	World Regional Geography I or Contemporary World Politics I	3
Lo-201	Business Logistics	3
Ma-222	Marketing Management	3
Ma-242	Managerial Accounting	3
	Total Credits	15-16

#### *Spring Semester*

Hc-232	Management Communication	3
Hc	Foreign Language I	3
Lo-213	Freight Transportation	3
Ma-243	Financial Management	3
Ms-253	Statistics for Business and Management	3
	Total Credits	15

### **Summer Semester**

Lo-200	IBL Cooperative Industrial Field Experience (Dept. Elective; optional)	3
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## JUNIORS

### **Fall Semester**

Ge-210 or Po-330	World Regional Geography II or Contemporary World Politics II or General Education Elective	3
Hc-211	Humanities II	3
Lo-311	Logistics Information System	3
Ma-312	Production and Operations Management	3
Ma-332	Business Law	3
	Total Credits	15

### **Spring Semester**

Ge-210 or Po-330	World Regional Geography II or Contemporary World Politics II or General Education Elective	3
Lo-334	Global Purchasing and Material Handling	3
Ma-304	International Business	3
Ma-342	International Human Resource Management	3
	Departmental Elective	3
	Total Credits	15

### **Summer Semester**

Lo-400	Co-op Educational Experience in IBL	3-4
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## SENIORS

### **Fall Semester**

Lo-432	Strategic Supply Chain Management	3
Ma-401	Organizational Behavior	3
	Departmental Elective	3
	General Education Elective	3
	General Education Elective	3
	Total Credits	15

### **Spring Semester**

Lo-422	International Logistics	3
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Ma-422	International Business Law	3
	Free Elective	3
	General Education Elective	3
	Social Science Elective	3
	Total Credits	15

Total Credits: 127-129 (127 for those who take Oc-101 and a 3-credit co-op).

Foreign Language courses may be substituted for General Education electives. Cs-150, Cs-210, or Cs-220 may be substituted for Cs-100. Ms-110 or Ms-150 may be substituted for Ms-151.

A minimum of fifty percent of business and logistics credit hours required for the IBL major must be earned at Maine Maritime Academy. In addition to meeting the college requirement for graduation with at least a 2.0 grade point average for the B.S. degree, graduating IBL majors are required to have a minimum grade point average of 2.25 in the IBL program core courses. For the IBL program, core courses are defined as courses with the prefixes Ec, Lo, and Ma.

Participation in the Regiment is optional when enrolled in this program. However, students electing to participate in First Year Cruise (Cr-103) are subject to the [Priority for Course Registration](#) policy, must have been in the Regiment for the year and meet the following prerequisites: 4/C Maintenance; Ship's Orientation; Ocean Survival (Pe-114), Fire Training, and Ns-101.

## Marine Transportation Operations

The Marine Transportation Operations curriculum is organized to develop those skills and abilities that are necessary in pursuing a professional career at sea. Students majoring in this program also may participate in any minor/concentration programs. Successful completion of this program leads to a Bachelor of Science degree and the opportunity to sit for a federal examination for the U.S. Coast Guard Third Mate's unlimited license. In addition to meeting the college requirement for graduation with at least a 2.0 grade point average for the B.S. degree, graduating students are required to have a minimum grade point average of 2.25 in the MTO program core courses. For the MTO program, core courses are defined as courses with the prefix Ns.

The following table outlines the normal sequence of courses taken by students majoring in Marine Transportation Operations:

### FIRST-YEAR STUDENTS

#### *Fall Semester*

Cs-150	Structured Problem Solving With Computers	3
Eg-101	Fundamentals of Engineering Operations	2
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Ns-101	Introduction to Nautical Science	2
Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
Pd-101	Personal Development I	0.5
USCG1	Fire Fighting	
	Total Credits	15.5

Each first-year student must pass Pe-114.

#### *Spring Semester*

Hc-112	Humanities I	3
Ms-110	Technical Calculus I	4
Ns-102	Ship Structure	3
Ns-241	Seamanship	2
Ps-102	Technical Physics I	4
Pd-102	Personal Development I	0.5
Mt-12D	Maintenance 4 <sup>th</sup> Class	
	Total Credits	16.5

#### *Summer*

Cr-103	First-Year Cruise	4
Mt-13D	Summer Maintenance 4 <sup>th</sup> Class (optional)	

### SOPHOMORES

#### *Fall Semester*

Ns-122	Cargo I	3
Ns-271	Terrestrial Navigation I	3
Ns-272	Terrestrial Navigation I Lab	1

Oc-101	Introduction to Ocean Science	3
Ps-201	Technical Physics II	4
	General Education Elective	3
Pd-201	Personal Development II	0.5
Mt-21D	Maintenance 3 <sup>rd</sup> Class	
	Total Credits	17.5

### **Spring Semester**

Ns-131	Introduction to Marine Transportation	3
Ns-210	Tanker Operations	4
Ns-262	Navigation Rules I	3
Ns-282	Celestial Navigation I	3
Ns-292	Electronic Navigation	3
Pd-202	Personal Development II	0.5
	Total Credits	16.5

### **Summer**

Cd-203	Cadet Shipping	4
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## **JUNIORS**

### **Fall Semester**

Hc-211	Humanities II	3
Ns-301	Stability	3
Ns-345	Ship Handling	3
	Free Elective I	3
	General Education Elective	3
Pe	Physical Education	1
Pd-301	Personal Development III	
	Total Credits	16

### **Spring Semester**

Ns-221	Meteorology	3
Ns-332	Marine Communications	3
Ns-381	Terrestrial Navigation II	3
	Free Elective II	3
	Free Elective III	3
Pd-302	Personal Development III	
Mt-32D	Maintenance 2 <sup>nd</sup> Class	
	Total Credits	15

### **Summer**

Cd-303	Junior Cruise	4
Mt-33D	Summer Maintenance 2 <sup>nd</sup> Class	

## SENIORS

### *Fall Semester*

Ns-420	Ship's Business	3
Ns-461	Casualty Analysis	3
Ns-491	Advanced Navigation	3
Ns-499	Topics in Marine Transportation	2
	Technical Elective	3
Pd-401	Personal Development IV	
Mt-41D	Maintenance 1 <sup>st</sup> Class	
	Total Credits	14

### *Spring Semester*

Hc-232	Management Communications	3
Md-310	Basic Shipboard Medicine	3
Ns-498	Watchkeeping	3
	Free Elective IV	3
	Technical Elective	3
Pd-402	Personal Development IV	
	Total Credits	15

Credits Required for Graduation: 138

Additional requirements for graduation:

- a. Complete practical training and regimental requirements as published in the Regimental Manual.
- b. Pass both practical and written portions of USCG lifeboatman examination and the USCG Third Mate's examination.
- c. Complete sea time requirements as required for the USCG license.
- d. Fulfill one elective with Po-230 (Contemporary World Politics I), Ec-102 (Microeconomics), Ec-201 (Macroeconomics), Ge-200 (World Regional Geography I), or Ge-210 (World Regional Geography II).

## Small Vessel Operations

The Small Vessel Operations curriculum is designed to prepare students for positions of responsibility in the operation and management of a variety of private and commercial vessels. The program is organized in a two-plus-two format offering a two-year Associate in Science degree and a four-year Bachelor of Science degree. U.S. Coast Guard licenses also are available.

Four academic semesters, plus a cooperative work experience during the summer following the first year, lead to an Associate in Science degree. Four additional academic semesters plus two additional cooperative work experiences and a training cruise, lead to a Bachelor of Science degree.

A student completing the A.S. degree requisites and an appropriate cooperative work experience, and meeting the applicable USCG requirements, may be eligible to sit for the USCG examination for a license as mate of vessels not more than 200 tons, operating in near-coastal waters, up to 200 miles offshore.

A student completing the B.S. degree requisites, two additional cooperative work experiences on appropriately-sized vessels, and a training cruise, and meeting the USCG requirements, may be eligible to sit for the USCG examination for a license as mate of vessels not more than 500 tons, near coastal or oceans.

Participation in the Regiment of Midshipmen is optional when enrolled in this program. However, students electing to participate in First Year Cruise on the Training Ship *State of Maine* are subject to the [Priority for Course Registration](#) policy, must have been in the Regiment for the year and meet the following prerequisites: 4/C Maintenance; Ship's Orientation; Ocean Survival (Pe-114), Fire Training, and Ns-101. In addition to meeting the college requirement for graduation with at least a 2.0 grade point average for the A.S. and B.S. degrees, graduating students are required to have a minimum grade point average of 2.25 in the SVO program core courses. For the SVO program, core courses are defined as courses with the prefix Ns, Yt, and Yo.

The following table outlines the normal sequence of courses taken by students majoring in Small Vessel Operations.

### FIRST-YEAR STUDENTS

#### **Fall Semester**

Cs-150	Structured Problem Solving With Computers	3
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Ns-101	Introduction to Nautical Science	2
Pe-100	Basic Sailing	0.5
Pe-114	Ocean Survival	0.5
Yo-103	Boatyard Operations	2
USCG1	Fire Fighting	
	Total Credits	15

#### **Spring Semester**

Hc-112	Humanities I	3
Ns-241	Seamanship	2
Ps-102	Technical Physics I	4
Yt-102	Small Craft Technology	3
Yt-105	Small Craft Construction	3
	Total Credits	15

#### **Summer**

Yo-203	Small Vessel Operations Cooperative Work Experience I	3
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## SOPHOMORES

### *Fall Semester*

Ns-122	Cargo I	3
Ns-271	Terrestrial Navigation I	3
Ns-272	Terrestrial Navigation I Lab	1
Oc-101	Introduction to Ocean Science	3
Yt-210	Marine Systems	3
	General Education Elective I	3
	Total Credits	16

### *Spring Semester*

Ns-221	Meteorology	3
Ns-262	Navigation Rules I	3
Ns-292	Electronic Navigation	3
Yo-298	Topics in Small Vessel Operations	2
Yo-299	200 Ton License Preparation	1
	Department Elective	3
	Total Credits	15

Credits Required for Graduation: 67

### *Summer*

Yo-303	Small Vessel Operations Cooperative Work Experience II	3
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## JUNIORS

### *Fall Semester*

Hc-211	Humanities II	3
Ns-301	Stability	3
Ns-332	Marine Communications	3
Ns-345	Ship Handling	3
	Physical Education	0.5
	General Education Elective II	3
	Total Credits	15.5

### *Spring Semester*

Eg-392	Diesel Power II	3
Ns-282	Celestial Navigation I	3
Ns-342	Workboat Operations	3
Ns-381	Terrestrial Navigation II	3
	Free Elective I	3
	Physical Education	0.5
	Total Credits	15.5

### *Summer*

Cr-313	SVO Training Cruise	2
Yo-403	Small Vessel Operations Cooperative Work Experience III	3
	Total credits	5

## SENIORS

### *Fall Semester*

Ns-491	Advanced Navigation	3
Ns-497	Watchkeeping Limited Tonnage	3
Ns-499	Topics in Marine Transportation	2
	Department Elective	3
	General Education Elective III	3
	Total Credits	14

### *Spring Semester*

Md-310	Basic Shipboard Medicine	3
Hc-232	Management Communications	3
Ns-461	Casualty Analysis	3
	Business Elective	3
	General Education Elective IV	3
	Total Credits	15

Total for Bachelor of Science Degree 132 credit hours.

UPDATED 6/17/2009

## Maritime Management and 200 Ton Limited License

A 30 month program is available at the graduate level for qualified applicants intending to pursue the 200 Ton Limited License simultaneously with the M.S. degree in Maritime Management. [Please contact the graduate school for more information.](#)

## Small Craft Design

The Small Craft Design program leads to an Associate of Science degree that is offered jointly by Maine Maritime Academy in Castine and The Landing School of Boatbuilding and Design in Kennebunkport, Maine. Students spend one year at Maine Maritime Academy as residential students in Castine and one year at The Landing School in Kennebunkport. Students must meet admission criteria for both institutions to be accepted in this degree program.

The objectives of the Small Craft Design major are to provide students with a structured learning environment in which they can become knowledgeable and proficient in the practical application of the fundamental principles of small craft design, and develop the skills to communicate effectively with other industry professionals by graphical and other methods as appropriate.

The following table outlines the normal sequence of courses taken by students majoring in Small Craft Design:

### FIRST-YEAR at Maine Maritime Academy

#### **Fall Semester**

Cs-150	Structured Problem Solving With Computers	3
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Ns-101	Introduction to Nautical Science	2
Pe-100	Sailing	0.5
Pe-114	Ocean Survival	0.5
Yo-103	Boatyard Operations	2
USCG-1	Fire Fighting	
	Total Credits	15

#### **Spring Semester**

Et-101	Graphics	3
Hc-112	Humanities I	3
Ps-102	Technical Physics I	4
	Major Elective	3
	Free Elective	3
	Total Credits	16

#### **Summer**

Yo-203 or Yo-213	Small Vessel Ops. Coop. Work Experience	3
	Small Craft Design Coop. Work Experience	2

Total at Maine Maritime Academy 33 - 34 credit hours

### SECOND-YEAR at The Landing School

#### **First Quarter**

Ct-101	Construction 1	2.5
De-101	Design 1	3.5
St-101	Strength 1	2

Td-101	Topics in Design 1	0.5
	Total Credits	8.5

***Second Quarter***

Cd-101	CAD 1	2
Ct-102	Construction 2	2
De-102	Design 2	2
St-202	Strength 2	2
Td-102	Topics in Design 2	0.5
	Total Credits	8.5

***Third Quarter***

Cd-201	CAD 2	1
Ct-201	Construction 3	3
De-201	Design 3	3
Td-201	Topics in Design 3	0.5
	Total Credits	7.5

***Fourth Quarter***

Cd-301	CAD 3	1
Ct-202	Construction 4	3
De-202	Design 4	2
Td-202	Topics in Design 4	0.5
	Total Credits	6.5

Total at The Landing School 31 credit hours

Total credit hours to complete the Associate in Science degree in Small Craft Design 64 - 65.

## Small Vessel Systems

The Small Vessel Systems program leads to an Associate of Science degree that is offered jointly by Maine Maritime Academy in Castine and with The Landing School of Boatbuilding and Design in Kennebunkport, Maine. Students spend one year at Maine Maritime Academy as residential students in Castine and one year at The Landing School in Kennebunkport. Students must meet admission criteria for both institutions to be accepted in this degree program.

The Small Vessel Systems program emphasizes the interface of marine systems with boat design and construction while practicing the actual installation of these systems in a real world setting.

The following table outlines the normal sequence of courses taken by students majoring in Small Vessel Systems:

### FIRST-YEAR STUDENTS at Maine Maritime Academy

#### **Fall Semester**

Cs-150	Structured Problem Solving With Computers	3
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Ns-101	Introduction to Nautical Science	2
Pe-100	Sailing	0.5
Pe-114	Ocean Survival	0.5
Yo-103	Boatyard Operations	2
USCG-1	Fire Fighting	
	Total Credits	15

#### **Spring Semester**

Hc-112	Humanities I	3
Ns-241	Seamanship	3
Ps-102	Technical Physics I	4
	Major Elective	3
	General Education Elective	3
	Total Credits	16

#### **Summer**

Yo-203	Small Vessel Ops. Coop. Work Experience	3
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Total at Maine Maritime Academy 34 credit hours

### SECOND-YEAR STUDENTS at The Landing School

#### **First Quarter**

	Shop Practices, Methods and Materials	2
	Composites	2
	Propulsion I	2
	DC Electrical I	3
	Total Credits	9

***Second Quarter***

DC Electrical II	3
Propulsion II	6
Steering & Controls	1
Total Credits	10

***Third Quarter***

Plumbing, Pumps and Seacocks	4
Sailing Equipment	1
Marine Electronics	1
Mechanical Specials	1
AC Electrical	3
Total Credits	10

***Fourth Quarter***

Refrigeration	3
Project Boat Lab	3
Total Credits	6

Total at The Landing School 35 credit hours

Total credit hours to complete the Associate in Science degree in Small Vessel Systems 69.

## OCEAN STUDIES MAJORS

The Corning School of Ocean Studies offers two majors leading to a Bachelor of Science degree. A minor program in Oceanography is offered by this department. A concentration in Marine Biology is also offered, which may be elected by Marine Science majors.

Marine Science and Marine Biology majors may elect to participate in the Teaching Certification Program. This program prepares students to teach at the secondary school level.

Participation in the Regiment of Midshipmen is optional when enrolled in these programs. However, students electing to participate in First Year Cruise must have been in the Regiment for the year and meet the following prerequisites: 4/C Maintenance; Ship's Orientation; Ocean Survival (Pe-114), Fire Training, and Ns-101. A passport and TWIC (transportation worker identification credential) card are required in order to go on cruises. The [Priority for Course Registration](#) policy applies to cruise courses.

### Marine Science

The Marine Science major prepares students in the field of marine science, with an emphasis on problem solving and decision making in an ocean setting. This broad-based marine science curriculum encompasses the study of chemistry, biology, physics, geology, writing and communications, computer science, mathematics, humanities, and social sciences. Graduates of the program may pursue employment in the various fields of ocean sciences (resource management, aquaculture, research, environmental protection, science education, or oceanography) or graduate education.

The sequence of courses shown below will be taken by candidates for the Bachelor of Science in Marine Science. Some Marine Science courses are only offered in alternate years, so curricula for students entering in an even or odd year are both shown.

#### FIRST-YEAR STUDENTS - For Students Entering in An Even Year

##### **Fall Semester**

Bi-101	General Biology I	4
Ch-210	General Chemistry I	4
Hc-111	Composition	3
Os-101	Introduction to Marine Science	4
	Total Credits	15

\*SVO double majors could consider taking Ns-101

##### **Spring Semester**

Bi-102	General Biology II	4
Ch-220	General Chemistry II	4
Ms-150	Calculus I	4
Os-001	Ocean Studies Seminar I	0.5
Pe	Swim Related*	0.5-1
	Humanities/Social Science Elective I	3
	Total Credits	16-16.5

\*Each first-year student must pass one of Pe-102, 103, 113 or 114.

#### SOPHOMORE YEAR

##### **Fall Semester**

Bi-220	Marine Botany* or HH/SS Elective II	3-4
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Ms-160	Calculus II	4
Ns-101	Introduction to Nautical Science	2
Os-002	Ocean Studies Seminar II	0.5
	Physical Education Elective	0.5
	Free Elective I	3-4
	Total Credits	13-15

*\*Student is required to either take Bi-220 Marine Botany or Bi-210 Marine Zoology. Student not taking Bi-220 Marine Botany should take a HH/SS Elective.*

### **Spring Semester**

Bi-210	Marine Zoology** or HH/SS Elective II	3-4
Os-003	Ocean Studies Seminar III	0.5
Os-203	Design and Applied Statistics in Science	4
Os-212	Marine Geochemistry	3
Ps-162	Physics I	4
	Total Credits	14.5-15.5

*\*\*Student is required to either take Bi-210 or Bi-220. Student not taking Bi-210 should take a Free Elective.*

## **JUNIOR YEAR**

### **Fall Semester**

Os-004	Ocean Studies Seminar IV	0.5
Os-204	Physical Geology	4
Ps-261	Physics II	4
	HH/SS Elective III	3
	Department Elective I	3-4
	Physical Education Elective	0.5
	Total Credits	15-16

### **Spring Semester**

Hc-112	Humanities I	3
Os-005	Ocean Studies Seminar V	0.5
Os-211	Marine Geology	3
Os-400	Research Preparation	4
	Department Elective II	3-4
	Free Elective II	3-4
	Total Credits	16.5-18.5

## **SENIOR YEAR**

### **Fall Semester**

Hc-211	Humanities II	3
Oc-210	Physical Oceanography	4
Os-006	Ocean Studies Seminar VI	0.5
Os-401	Research Project	4
	Department Elective III	3-4
	Physical Education Elective	0.5

Total Credits 15-16

### **Spring Semester**

Department Elective IV	3-4
Free Elective III	3-4
Free Elective IV	3-4
Free Elective V	3-4
Total Credits	12-16

Credits required for Graduation: 117-128.5

### **FIRST-YEAR STUDENTS - For Students Entering in An Odd Year**

#### **Fall Semester**

Bi-101	General Biology I	4
Ch-210	General Chemistry I	4
Hc-111	Composition	3
Os-101	Introduction to Marine Science	4
	Total Credits	15

\*SVO double majors could consider taking Ns-101

#### **Spring Semester**

Bi-102	General Biology II	4
Ch-220	General Chemistry II	4
Ms-150	Calculus I	4
Os-001	Ocean Studies Seminar I	0.5
Pe	Swim Related*	0.5-1
	Humanities/Social Science Elective I	3
	Total Credits	16-16.5

\*Each first-year student must pass one of Pe-102, 103, 113 or 114.

### **SOPHOMORE YEAR**

#### **Fall Semester**

Ms-160	Calculus II	4
Ns-101	Introduction to Nautical Science	2
Os-002	Ocean Studies Seminar II	0.5
Os-204	Physical Geology	4
	Physical Education Elective	0.5
	Free Elective I	3-4
	Total Credits	14-15

#### **Spring Semester**

Bi-210	Marine Zoology* or HH/SS Elective II	3-4
Os-003	Ocean Studies Seminar III	0.5
Os-203	Design and Applied Statistics in Science	4

Os-211	Marine Geology	3
Ps-162	Physics I	4
	Total Credits	14.5-15.5

*\*Student is required to either take Bi-210 Marine Zoology or Bi-220 Marine Botany. Student not taking Bi-210 Marine Zoology should take a Free Elective.*

## JUNIOR YEAR

### **Fall Semester**

Bi-220	Marine Botany** or HH/SS Elective II	3-4
Oc-210	Physical Oceanography	4
Os-004	Ocean Studies Seminar IV	0.5
Ps-261	Physics II	4
	Department Elective I	3-4
	Physical Education Elective	0.5
	Total Credits	15-17

*\*\*Student is required to either take Bi-220 or Bi-210. Student not taking Bi-220 should take a HH/SS Elective.*

### **Spring Semester**

Hc-112	Humanities I	3
Os-005	Ocean Studies Seminar V	0.5
Os-212	Marine Geochemistry	3
Os-400	Research Preparation	4
	Department Elective II	3-4
	Free Elective II	3-4
	Total Credits	16.5-18.5

## SENIOR YEAR

### **Fall Semester**

Hc-211	Humanities II	3
Os-006	Ocean Studies Seminar VI	0.5
Os-401	Research Project	4
	Department Elective III	3-4
	HH/SS Elective III	3
	Physical Education Elective	0.5
	Total Credits	14-15

### **Spring Semester**

	Department Elective IV	3-4
	Free Elective III	3-4
	Free Elective IV	3-4
	Free Elective V	3-4
	Total Credits	12-16

Credits required for Graduation: 117-128.5

## Marine Biology

The Marine Biology major focuses its training and experiences on the biological component of Ocean Studies. This major provides instruction in essential biology courses (biology, ecology, physiology, cell biology and genetics) as well as more specialized topics relevant to marine organisms. Graduates may pursue graduate education as well as careers in fisheries, aquaculture, environmental management, consulting, and public education.

The following sequence of courses will be taken by candidates for the Bachelor of Science in Marine Biology:

### FIRST-YEAR STUDENTS

#### *Fall Semester*

Bi-101	General Biology I	4
Ch-210	Chemistry I	4
Hc-111	Composition	3
Os-101	Introduction to Marine Science	4
	Total Credits	15

#### *Spring Semester*

Bi-102	General Biology II	4
Ch-220	Chemistry II	4
Hc-112	Humanities I	3
Ms-150*	Calculus I	4
Os-001	Ocean Studies Seminar I	0.5
Pe-102/103/ 113/114	Swim Related PE	0.5
	Total Credits	16

### SOPHOMORE YEAR

#### *Fall Semester*

Bi-220	Marine Botany	4
Ch-310	Organic Chemistry	4
Ms-160*	Calculus I or Calculus II	4
Os-002	Ocean Studies Seminar II	0.5
Ps-102	Technical Physics I	4
	Total Credits	16.5

#### *Spring Semester*

Bi-210	Marine Zoology	4
Os-003	Ocean Studies Seminar III	0.5
Os-203	Design and Applied Statistics in Science	4
Pe	Physical Education	1
Ps-201	Technical Physics II	4
	Free Elective I	3-4
	Total Credits	16.5-17.5

## JUNIOR YEAR

### *Fall Semester*

Bi-201	Ecology	4
Bi-301	Marine Organisms Physiology	4
	Humanities/Social Science Elective I	3
Os-004	Ocean Studies Seminar IV	0.5
	Free Elective II	3-4
Pe	Physical Education	0.5
	Total Credits	15-16

### *Spring Semester*

Bi-308	Cell Biology	4
Bi-312	Genetics	3
Hc-211	Humanities II	3
Os-005	Ocean Studies Seminar V	0.5
Os-400	Preparation for Research in Marine Science	4
	Total Credits	14.5

## SENIOR YEAR

### *Fall Semester*

	Department Elective I	3-4
Os-006	Ocean Studies Seminar VI	0.5
Os-401	Research Project	4
	Free Elective III	3-4
	Humanities/Social Science Elective II	3
	Total Credits	13.5-15.5

### *Spring Semester*

	Department Elective II	3-4
	Department Elective III	3-4
	Free Elective IV	3-4
	Humanities/Social Science Elective III	3
	Total Credits	12-15

Credits required for Graduation: 119-126

\* Student must complete both Ms-150 Calculus I and Ms-160 Calculus II for the Bachelor of Science degree, but may choose to take Ms-101 Pre-calculus prior to beginning the Ms-150/Ms-160 sequence.

### January Course

Tropical Marine Science (Os-325) is currently offered in alternate years during the winter interterm period at a marine laboratory in the Caribbean. Students may register for this course with permission of their advisors and the Department Chair. This course is open to any student meeting the necessary prerequisites (Bi-210 or Bi-220, Os-101).

## Course Descriptions

Each course's abbreviation, number, title, description, prerequisites (if any), and credits are listed below. Courses offered at the Bath Iron Works Shipyard as part of the Ship Design and Ship Production majors and at The Landing School as part of the Small Craft Design program are listed at the end of this section.

### Course Abbreviations

Bi Biology	Md Medicine
Ch Chemistry	Ms Mathematics
Co Cooperative Education	Ns Nautical Science
Cr Cruise	Na Naval Architecture
Cs Computer	Nv Naval Science
Ec Economics	Oc Ocean Studies
Eg Engineering Operations	Os Ocean Studies
En Environmental	Pd Personal Development
Es Engineering	Pe Physical Education
Et Engineering Technology	Po Political Science
Ge Geography	Ps Physics
Hc Humanities & Communications	Py Psychology
Hy History	Ym Small Vessel Management
Ll Lifelong Learning	Yo Small Vessel Operations
Lo Logistics	Yt Small Vessel Technology
Ma Management	

Cr = credit hour; Lab = Laboratory hours; Rec = Recitation or lecture hours.

## BIOLOGY

**Bi-101: GENERAL BIOLOGY I** - An introductory course in modern biology covering the following topics: evolution and the diversification of life, including principles of taxonomy and diversity of form; function and structure of plants including transport, nutrition, sensory systems, reproduction, and defense; function and structure of animals including nutrition, digestion, gas exchange, circulation, excretion, chemical and electrical signals, reproduction, and the immune system; ecology, including behavior, population ecology, species interactions, community ecology, and ecosystems. Rec. 3, Lab. 3, Cr. 4.

**Bi-102: GENERAL BIOLOGY II** - Introduction to the concepts and principles of modern biological thought with coverage of the following topics: the chemical basis of life including atoms, molecules, organic macromolecules, and cellular structure and function; cell division, including mitosis and meiosis; the fundamentals of Mendelian genetics, gene structure and expression, and current research in the field of genetics; developmental biology and cellular differentiation; evolutionary patterns and processes. Prerequisite: Bi-101. Rec. 3, Lab. 3, Cr. 4.

**Bi-201: ECOLOGY** - An introductory course in ecology. A study of the interactions of organisms with each other and with their abiotic environment. Topics include environmental factors, population ecology, community ecology, and ecosystem energetics. Emphasis is on illustration of basic principles using the local marine ecosystem. Prerequisite: Bi-102. Rec. 3, Lab. 3, Cr. 4.

**Bi-210: MARINE ZOOLOGY** - An overview of animal biology in the marine environment. Physiology, behavior, ecology, and evolution of marine unicellular and multicellular animals will be presented. The laboratory portion of the course will focus on the diversity and habitats of marine animals in the Gulf of Maine region. Prerequisite: Bi-102. Lec. 3, Lab. 3, Cr. 4.

**Bi-218: ANIMAL BEHAVIOR** - The evolution and ecology of animal behavior is explored in detail. The evolution and diversity, as well as the ecological consequences, of behavior will be studied. Topics include the genetics and physiology of behavior, perceptual systems, integration and storage of information, ecology of reproduction, feeding behavior, habitat selection and migration, and social behavior. Prerequisite: Bi-102. Rec. 3, Cr. 3.

Bi-220: MARINE BOTANY - An introduction to the taxonomic, physiological, chemical, and ecological aspects of marine photosynthesizers. Topics covered include: marine plant environments, physiological ecology, the influence of anthropogenic effects on marine photosynthesizers, as well as an examination of microalgae, seaweeds, salt marsh plants, and sea grasses. Laboratory emphasis is on a survey of marine flora and habitats found in the Gulf of Maine. Prerequisite: Bi-102. Rec. 3, Lab 3, Cr. 4.

Bi-301: MARINE ORGANISM PHYSIOLOGY - Physiology examines the processes of cells, tissues, and organ systems. This course is designed to allow an understanding of how physiological processes relate to how organisms function in their environment. We will utilize three primary approaches: (1) structure/function studies examining how the morphology of a system relates to function, (2) comparative discussions contrasting the mechanisms by which marine plants and animals are adapted to life in the marine environment, and (3) evolutionary comparisons of how different organ systems have evolved within and throughout marine taxa. Prerequisite: Bi-102. Rec. 3, Lab 3, Cr. 4.

Bi-306: ICHTHYOLOGY - An introductory course in the biology of fishes. Topics include: anatomy and physiology, ecology, evolution and behavior of fishes, classification of fishes, and the conservation and management of fish and fisheries. Prerequisites: Bi-210 or 220. Rec. 3, Lab. 3, Cr. 4.

Bi-308: CELL BIOLOGY - This course is an overview of the fundamental structure and function of biomolecules and organelles of the plant and animal cell. Cell structure and function topics include membrane phenomena, cytoskeleton, gene expression (replication, transcription, translation), protein sorting and function, secretory pathways, signal transduction, and cell cycle. Additional areas include energy production and utilization, cellular biosynthesis, and control of cellular activities. Prerequisites: Bi-102 and Ch-310. Rec. 3, Lab. 3, Cr. 4.

Bi-312: GENETICS - This course is an introduction to genetics from the molecular to the population level. The course covers concepts of classical Mendelian genetics, prokaryote genetics, maintenance of variability, gene interactions, and modern genomics. Genetics in ecological and evolutionary settings will be emphasized. Modern genetic techniques and technologies will be described as well. Prerequisites: Bi-102 and Ch-310. Rec. 3, Cr. 3.

Bi-321: BIOLOGY OF SYMBIOSIS - Symbiosis is the interaction between two or more different types of organisms in an ecological setting. Interactions such as mutualism, commensalism, parasitism, and predation occur at the cellular, organismal, and community levels. Relevant marine, aquatic, and terrestrial examples of symbiotic relationships will be investigated and discussed in order to appreciate the biological and evolutionary significance of these remarkable associations. Prerequisites: Bi-201 and Bi-301. Rec. 3, Cr. 3.

Bi-322: MARINE ECOLOGY - An examination of the principles of ecology as applied in the marine environment. This course will explore our present understanding of the dynamics of marine populations and communities as well as the role that marine ecology has played in forming our views of how all ecological systems function. Prerequisites: Bi-201, Bi-210 or Bi-220, and Os-203. Rec. 3, Cr. 3.

Bi-323: BIOGEOGRAPHY - A course examining the distribution of organisms on Earth. Topics covered will include global and regional biogeographic patterns, early Earth and fundamental biogeographic processes, phylogeography, ecological biogeography, and conservation biogeography. This course will also explore current biogeography topics by discussing papers from primary literature. Prerequisites: Bi-201. Rec. 3, Cr. 3.

Bi-499: SPECIAL TOPICS IN BIOLOGY - A course allowing students to pursue instruction not normally offered in the curriculum, through any combination of lecture and laboratory. Departmental approval required. Prerequisite: Ms-101. Cr. 1-3 as appropriate.

## CHEMISTRY

Ch-210: CHEMISTRY I - An introduction to the nature and properties of matter at the atomic and molecular level; chemical changes; stoichiometry; energy changes; structure and periodicity of elements; states of matter, chemical bonding, and kinetics. Rec. 3, Lab. 3, Cr. 4.

Ch-220: CHEMISTRY II - A second course in chemistry dealing with equilibria of acids and bases; simple thermodynamics; electrochemistry, nuclear chemistry; metals and non-metals; and brief introduction to organic and biochemistry. Prerequisite: Ch-210. Rec. 3, Lab. 3, Cr. 4.

Ch-301: CHEMICAL PRINCIPLES - This course examines basic concepts of general chemistry, including: stoichiometry, atomic structure, periodic properties, chemical bonding, states and properties of matter, equilibria, acids and bases, and properties

of organic compounds. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Lab. 3, Cr. 4.

Ch-310: INTRODUCTION TO ORGANIC CHEMISTRY - An introduction to general organic chemistry with an emphasis on natural aspects of the topic. Areas of concentration will include: organic nomenclature, structural theory and stereochemistry of aliphatic and aromatic compounds, and chemical reactions of fundamental importance to organic chemistry. The laboratory will present a survey of analytic methods commonly employed in organic chemistry. Prerequisite: Ch-220. Rec. 3, Lab. 3, Cr. 4.

Ch-352: ENGINEERING CHEMISTRY - Atomic and molecular structure, bonding types and energies, stoichiometric computations, solutions, equilibria, oxidation-reduction, nuclear and organic chemistry. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Lab. 3, Cr. 4.

Ch-401: ENVIRONMENTAL CHEMISTRY - An investigation of the chemistry of the environment including the atmosphere, oceans, and geosphere. The interaction of physical, chemical, and biological processes and their impact on the chemistry of the environment is examined. Prerequisite: Ch-220. Rec. 3, Cr. 3.

Ch-402: ENVIRONMENTAL SAMPLING/ANALYSIS - A laboratory course in environmental chemical analysis, data collection, and interpretation. Procedures common in the environmental testing industry, such as quality control and assurance, will be employed. Prerequisite: Ch-220. Lab 3, Cr. 3.

## COOPERATIVE EDUCATION

Co-200: COOPERATIVE INDUSTRIAL FIELD EXPERIENCE I - A full-time work experience for power engineering technology students, normally with wage compensation, in shoreside industrial and utility power plants. The work experience must be related, in both theoretical and practical engineering, to the student's field of study in basic power engineering operations and maintenance. A minimum of ten full weeks or the equivalent at the discretion of the instructor, of employment is required to be eligible for credit in this course. Note: The combined satisfactory employment hours of Co-200 and Co-300, however, must total 1050 hours or more in a steam facility for the student to be eligible for the State of Maine Third Class Engineer (Stationary Plant) license. The course grade will be based on an extensive written project documenting this work experience. When registering for this course, the student must be in good academic standing. Students in a probation or warning status will not be eligible to participate in this course. Prerequisites: Eg-234, Eg-243, Eg-261, Et-101, Et-211, Et-371, Et-452, and drug free certification required. Cr. 2.

Co-201: PEO COOPERATIVE INDUSTRIAL FIELD EXPERIENCE I - A full-time work experience for power engineering operations students, normally with wage compensation, in shoreside, steam powered, industrial and utility power plants. The work experience must be related in both theoretical and practical engineering, to the student's field of study in basic power engineering operations and maintenance. A minimum of twelve full weeks or the equivalent at the discretion of the instructor, of employment is required to be eligible for credit in this course. Note: The combined satisfactory employment hours of Co-201 and Co-301, however, must total 1050 hours or more in a steam facility for the student to be eligible for the State of Maine Fourth Class Engineer (Stationary Plant) license. The course grade will be based on an extensive written project documenting this work experience. When registering for this course, the student must be in good academic standing. Students in a probation or warning status will not be eligible to participate in this course. Prerequisites: Eg-234, Eg-243, Eg-261, Et-101, Et-211, Et-371, Et-452, and drug free certification required. Cr. 2.

Co-203: COOPERATIVE EXPERIENCE IN ENGINEERING I - A full-time work experience for Design-option Marine Systems Engineering students, normally for wage compensation, in a real-world engineering environment. Credit will be awarded at  $\frac{1}{4}$  credit for each two weeks of satisfactory work, with a minimum of 1.5 credits required to earn credit for the course. Requirements include a daily work-activity journal (unless prohibited by documented national or company security concerns), a brief completion report, and a weekly e-mail report sent to the MSE Co-op Coordinator. Prerequisites: Student must have successfully completed the first two years of the Design options of the MSE program, be in good academic standing and not be on academic warning or probation, and drug free certification required. Cr. 1.5 to 4.0.

Co-300: COOPERATIVE INDUSTRIAL FIELD EXPERIENCE II - The second in a series of full-time work experiences for power engineering technology students, normally with wage compensation, in shoreside industrial and utility power plants. A continuation of Co-200 with emphasis on advanced power engineering operations, maintenance, organization, and management. A minimum of ten full weeks or the equivalent at the discretion of the instructor, of employment is required to be eligible for credit in this course. Note: The combined satisfactory employment hours of Co-200 and Co-300, however, must total 1050 hours or more in a steam facility for the student to be eligible for the State of Maine Third Class Engineer (Stationary Plant) license. The course

grade will be based on an extensive written project documenting this work experience. When registering for this course, the student must be in good academic standing. Students in a probation or warning status are not eligible to participate in this course.

Prerequisites: Co-200, Eg-382, Eg-431, Et-212, Et-378, Et-432, and drug free certification required. Cr. 2.

Co-301: PEO COOPERATIVE INDUSTRIAL FIELD EXPERIENCE II - The second in a series of full-time work experiences for power engineering operations students, normally with wage compensation, in shoreside, steam powered, industrial and utility power plants. A continuation of Co-201 with emphasis on advanced power engineering operations, maintenance, organization, and management. A minimum of twelve full weeks or the equivalent at the discretion of the instructor, of employment is required to be eligible for credit in this course. Note: The combined satisfactory employment hours of Co-201 and Co-301, however, must total 1050 hours or more in a steam facility for the student to be eligible for the State of Maine Fourth Class Engineer (Stationary Plant) license. The course grade will be based on an extensive written project documenting this work experience. When registering for this course, the student must be in good academic standing. Students in a probation or warning status are not eligible to participate in this course. Prerequisites: Co-201, Eg-321, Eg-372, Eg-382, Eg-431, and drug free certification required. Cr. 2.

Co-311: OCEAN STUDIES COOPERATIVE EXPERIENCE - A maximum of three credits will be offered for a directed cooperative education experience: students must submit a proposal for evaluation and approval of the Ocean Studies faculty at which time credits will be assigned; the final grade to be based on a cooperative education project report to be submitted by the student upon completion of the Co-op experience. Prerequisite: drug free certification required. Cr. 1-3.

Co-400: COOPERATIVE INDUSTRIAL FIELD EXPERIENCE - A period of work experience, normally full-time and paid, with private industry or government in a job related to the student's degree program and/or career goals and which differs significantly from previous experiences. Normally, credit will be awarded at the rate of 0.25 credits for each two weeks of full-time work experience. No student may earn more than four credits in this course during his/her enrollment at the Academy and these credits cannot be substituted for any other degree or minor program requirements. Prerequisite: MSE program coordinator's approval and drug free certification required. Cr. 0.5 to 4.0. (Students in Marine Systems Engineering are required to successfully complete 1.5 credits of this course.)

Co-410: MARITIME TRANSPORTATION COOPERATIVE INDUSTRIAL FIELD EXPERIENCE - A period of work experience, normally full-time and paid, with private industry or government in a job related to the student's degree program and/or career goals and which differs significantly from previous experiences. Normally, credit will be awarded at the rate of one-half credit for each two weeks of full-time work experience. Grading will be on a satisfactory/unsatisfactory basis. No student may earn more than four credits in cooperative education during his/her enrollment at the Academy and these credits cannot be substituted for any other degree or minor program requirements. Prerequisite: Department Chair approval and drug free certification required. Cr. 0.5 to 4.

Lo-200: IBL COOPERATIVE INDUSTRIAL FIELD EXPERIENCE - A period of work experience, normally full-time and paid, with private industry or government in a job related to the student's IBL degree program and/or career goals and which differs significantly from previous experiences. Ten weeks of employment are expected with usual IBL academic requirements of weekly write-ups, Co-op summary report, and a completed project with report. This course may be counted as an elective in the IBL Curriculum but may not be substituted for Lo-400 which is required after the junior year. Prerequisite: IBL program coordinator's approval, sophomore standing or department chair permission, and drug free certification required. Cr. 3.

Lo-400: CO-OP EDUCATIONAL EXPERIENCE IN IBL - A period of work experience, normally full-time and paid, with the private or public sector including non-profit organizations, in a job related to the student's degree program and/or career goals, and which differs significantly from previous experiences. Normally, credit will be awarded at the rate of one credit for four weeks of full-time work experience. An extensive written project is required and grading will be on a satisfactory or unsatisfactory basis. All IBL students are required to earn a minimum of three co-op credits (twelve weeks of full-time work experience). No student may earn more than four credits in cooperative education during his/her enrollment at MMA and these credits cannot be substituted for any other degree or minor program requirements. Prerequisite: IBL program coordinator's approval, junior standing or department chair permission, and drug free certification required. Cr. 3-4.

Yo-203: SMALL VESSEL OPERATIONS COOPERATIVE WORK EXPERIENCE I - A minimum of 60 days of supervised work experience aboard an appropriate vessel. This cooperative work experience is intended to provide the student with an entry level deck position for training and sea service days toward a USCG 200 GT Mate/Near Coastal license. Students are encouraged to pursue vessel opportunities aligned with their particular interests. An extensive written sea project is required. (A total of 120 qualifying sea service days are required for the USCG 200 GT Mate/Near Coastal license). Prerequisite: Completion of the first year of the SVO program or approval of the SVO coordinator and drug free certification required. Cr. 3.

Yo-213: SMALL CRAFT DESIGN COOPERATIVE WORK EXPERIENCE - A minimum of 60 days of supervised work experience in the design, construction, or maintenance of small craft. This cooperative work experience is intended to provide the

student with an entry level experience. Prerequisite: Completion of the first year of Small Craft Design program or approval of the SCD coordinator and drug free certification required. Cr. 2.

Yo-303: SMALL VESSEL OPERATIONS COOPERATIVE WORK EXPERIENCE II - A minimum of 60 days of supervised work experience aboard an appropriate vessel greater than 50 gross tons. This cooperative work experience is intended to provide the student with a more advanced deck position, with increased responsibilities, for training and sea service toward a USCG 500 GT Mate/Near Coastal/Oceans license. Students are encouraged to pursue vessel opportunities aligned with their particular interests. An extensive written sea project is required. (A total of 240 qualifying sea service days are required to the USCG 500 GT Mate/Near Coastal/Oceans license). Prerequisite: Completion of the second year of the SVO program or approval of the SVO coordinator and drug free certification required. Cr. 3.

Yo-403: SMALL VESSEL OPERATIONS COOPERATIVE WORK EXPERIENCE III - A minimum of 60 days of supervised work experience aboard an appropriate vessel greater than 50 gross tons. This cooperative work experience is intended to provide the student with a more advanced deck position, with increased responsibilities, for training and sea service toward a USCG 500 GT Mate/Near Coastal/Oceans license. Students are encouraged to pursue vessel opportunities aligned with their particular interests. An extensive written sea project is required. (A total of 240 qualifying sea service days, of which 30 days must be while holding an Able Bodied Seaman certificate, are required for the USCG 500 GT Mate/Near Coastal license. If 120 qualifying sea service days are presented while holding a 200 GT Mate license, the student will qualify for a 500 GT Mate/Oceans license). Prerequisite: Completion of the third year of the SVO program or approval of the SVO coordinator and drug free certification required. It is recommended that the student have an Able Bodied Seaman certificate or USCG 200 GT Mate license. Cr. 3.

#### **NOTES:**

Yo-303 or Yo-403 cooperative work experience may be accomplished aboard the *T.S. State of Maine* with the approval of the SVO coop coordinator and the Master of the training ship. Requirements for participation in the regiment and shipboard training must also be met.

A "sea service day" is considered as 8 hours of watchstanding or day-working. On vessels where a 12-hour working day is authorized and practiced, each working day may be creditable at one and one-half days. When the operating schedule makes an 8-hour day inappropriate, a creditable day may not be less than 4 hours. (See 46 CFR 10.103)

#### **CRUISE**

Cr-103: FIRST-YEAR CRUISE - Introduction to the shipboard responsibilities of deck and engineering officers. Orientation and practical experience in watch standing and ship maintenance procedures; an overview of ship systems designed to assist the student in the selection of a major field of study in marine transportation or engineering. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites for all majors include: Eg-101, Ns-101, Pe-114, participation in the Regiment; completion of the ship's Familiarization/Orientation Program; first year maintenance; fire training. Cr. 4.

Cd/Ce-203: CADET SHIPPING (Deck or Engine) - A cooperative experience in the Merchant Marine in which the student is normally assigned a billet aboard a commercial merchant ship by the director of cadet shipping. (In some cases this cruise may be accomplished aboard the *T.S. State of Maine*.) The student participates in the operation of the ship as a cadet engineer or mate by applying classroom lessons of the first two years. An extensive written sea project detailing all aspects of the experience is required. Prerequisites for engineers: students must not be on academic probation and must have passed Cr-103, Et-201, Eg-234, Eg-252, Eg-261 or Eg-265, Et-371 or Es-371, and Eg-292 or have a minimum of C- grade in each at the end of the 10th week of the current semester, or obtain permission of the Engineering Cadet Shipping Coordinator. Basic Safety Training and drug-free certification are also required. Prerequisite for mates: students must not be on academic probation and must have passed Cr-103, Ns-122, Ns-241, Ns-262, Ns-282, Ns-292, Mt-21D or Department Chair approval. Basic Safety Training and drug-free certification are also required. Cr. 4.

Cd/Ce-303: JUNIOR CRUISE (Deck or Engine) - The final cruise in a series of three. A thorough shipboard experience designed to prepare the student to understand fully the systems and operating procedures necessary for the execution of the responsibilities of a third engineer or third mate. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites for mates: Cd-203, Ns-221, Ns-301, Ns-332, Ns-345, Ns-381, Mt-32D or Department Chair approval. Prerequisites for engineers: Ce-203, Eg-372, Et-211 or Es-251; Maintenance Second Class. Cr. 4.

Cr-214: AUXILIARY SAIL TRAINING CRUISE - This two-month training cruise will introduce the Auxiliary Sail License Candidate to the preparation and operation of a large, traditional sailing vessel. One month will be spent fitting out the schooner *Bowdoin* (and other vessels) for the sailing season, and one month will be spent sailing. The itinerary will include both coastwise and offshore sailing. Prerequisites: Ns-241, Pe-100, Pe-114, Yt-102 and Fire Fighting. Cr. 4.

Cr-313: SVO TRAINING CRUISE - A two week training cruise for fourth year students that encompasses advanced practical training and STCW assessment. This is both a coastwise and offshore passage incorporating terrestrial and celestial navigation, watchkeeping, vessel handling, emergency operations, passage planning and the entering and clearing of foreign ports. The schooner *Bowdoin* is used for this course so the student is also exposed to sailing a traditionally rigged auxiliary sail vessel. Prerequisites: Ns-241, Ns-262, Ns-282, Ns-292, Ns-381. Cr. 2.

Ns-353: AUXILIARY SAIL OCEAN VOYAGING - This course is based on an ocean voyage of at least six weeks in duration. The educational component will be a mix of formal instruction and experiential learning. Fit out, route planning, voyage preparations, and provisioning are substantial components of the pre-departure curriculum. Underway components of the course include customs in foreign ports, practical navigation (terrestrial, electronic, and celestial), watch keeping, sail handling, and vessel maintenance. Students will maintain a logbook with daily weather observations, geography, vessel systems, and their learning process throughout the course. An emphasis on cultural, social, and environmental issues specific to the voyage will be explored. Prerequisites: Ns-241, Pe-100, Pe-114, Yt-102, and Fire Fighting. Cr. 4.

## COMPUTER SCIENCE

Cs-150: STRUCTURED PROBLEM SOLVING WITH COMPUTERS - A course in problem solving using computers and emphasizing a structured approach. Topics include structured solution methods, programming fundamentals, spreadsheet modeling, and an introduction to presentation software. Rec. 3, Cr. 3.

Cs-151: INTRODUCTION TO ENGINEERING PROGRAMMING - An introductory level course in computer programming and applications. This course introduces engineering students to basic structured programming and engineering mathematical software. Rec. 3, Cr. 3.

Cs-220: C/C++ PROGRAMMING - An intermediate course in computer programming, using C/C++. Prerequisite: Cs-150. Rec. 3, Cr. 3.

## ECONOMICS

Ec-102: MICROECONOMICS - Introduction to supply and demand, markets, externalities and public goods, the theory of the firm, industrial organization and game theory, and factor markets. Rec. 3, Cr. 3.

Ec-201: MACROECONOMICS - Introduction to national income accounting, business cycles, and inflation. Topics also include money and banking, monetary and fiscal policy. Rec. 3, Cr. 3.

## ENGINEERING OPERATIONS

Eg-101: FUNDAMENTALS OF ENGINEERING OPERATIONS - A study of basic mechanical power generation systems, with emphasis on the applicable technologies and their safe and efficient management. The course is designed to introduce both engineering and non-engineering students to operating engineering. The course provides a foundation for many engineering department courses. Rec. 3, Cr. 2.

Eg-234: POWER EQUIPMENT LAB - An introduction to marine and stationary power plant systems and equipment through study, inspection, and maintenance applications. Topics include lubrication and lube oil purification systems; pumps; air removal equipment; and heat exchangers; piping systems and valves; control systems for temperature, pressure, and flow; compressed air systems; distilling plants; and auxiliary steam turbines. In addition, basic equipment techniques and tag-out safety procedures are introduced. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Eg-101. Lab. 3, Cr. 2.

Eg-242: MACHINE TOOL PRACTICES - An introductory course in machine tool practices for Power Engineering Technology students. This course is designed to give students the basic theory and practical application necessary to work with and supervise the operation of machine tools and associated equipment such as engine lathe, milling machine, drill press, precision measuring and layout tools. PET students may take Eg-252 in place of this course and also apply Eg-252 toward the PET Free Elective requirement. Rec. 1, Lab. 0, Cr. 1.

Eg-243: WELDING - An introduction to and practice in the principles, safety aspects, and correct operations of arc welding and oxyacetylene cutting. Emphasis is on all-position shielded metal arc welding. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 1, Lab 2, Cr. 2.

Eg-252: MACHINE TOOL OPERATIONS I - An introductory course in machine tool practices. This course is designed to give students the basic theory and practical application necessary to operate machine tools and associated equipment such as engine lathe, milling machine, drill press, precision measuring and layout tools. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 1, Lab. 3, Cr. 2 .5.

Eg-261: STEAM GENERATORS I - The construction and design of marine boilers of all types, including fuel oil systems and equipment, feedwater analysis, furnace refractories, and U. S. Coast Guard construction regulations. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Eg-265: STEAM GENERATING SYSTEMS - A condensed version of Eg-261 (Steam Generators I) with more emphasis on principles of design, automation, and operation, and less emphasis on construction details. Prerequisite: Marine Systems Engineering Major or consent of instructor. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 2, Cr. 2.

Eg-292: DIESEL POWER I - Introductory study of diesel engine principles, covering typical construction features with pertinent systems including fuel, lubricating, cooling, starting and maneuvering, exhaust and heat recovery. Rec. 3, Cr. 3.

Eg-321: STEAM TURBINES I - A study of the elementary principles, descriptive classifications, and construction and accessories of various types of marine, stationary, and auxiliary turbines. Prerequisite: Et-211 or Es-251. Rec. 3, Cr. 3.

Eg-350: INTRODUCTION TO ENVIRONMENTAL REGULATIONS & ETHICAL INDUSTRIAL COMPLIANCE - This course is designed to develop each student's ability to recognize and effectively deal with compliance issues and professional ethics associated with environmental permitting procedures. The course will include an introduction to environmental science with a focus on defining standards pertaining to all aspects of pollutants, emissions, control technology, and enforcement. The course will consist of three primary areas: air quality, water quality including ballast water, and hazardous waste. This course supports the marine engineering license programs and may have embedded STCW assessment requirements. Prerequisites: Ch-301. Rec. 3, Cr. 3.

Eg-351: MACHINE TOOL OPERATIONS II - Practical study of the operation and utilization of lathes and milling machines. Provides a continuing opportunity to receive actual practice in threading and milling projects. Prerequisite: Eg-252. Rec. 1, Lab. 3, Cr. 2.5.

Eg-352: MACHINE TOOL OPERATIONS III - Designed to give the machine tool student experience in developing advanced machining skills. Training includes internal single point threading and boring; knurling, radius and taper turning on the lathe; and advanced milling machine operations using traditional machining methods. Computer numerical controlled programming and machining will be introduced. Traditional machining and computer numerical control (CNC) machining projects are required. Prerequisite: Eg-351 or permission of instructor. Rec. 1, Lab. 2, Cr. 2.

Eg-372: ELECTRICAL POWER II - Builds on Et/Es-371 to develop an understanding of design, construction, operational characteristics, efficiency and maintenance of DC and single- and 3-phase AC machinery, and pulse-width modulation (PWM) and its applications to propulsion and industrial drives. Lab work will emphasize principles of safe and efficient operation, troubleshooting, and installation of electrical machinery and systematic use of measuring equipment. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Ms-110 or Ms-150, Et-371 or Es-371, Ps-102 or Ps-162, Ce-203 or Co-200. Rec. 2, Lab. 2, Cr. 3.

Eg-382: STEAM POWER SYSTEMS I - A study of measurement and adjustment techniques, and of control systems on modern main and auxiliary steam turbines. Includes lubrication systems, main propulsion shafting and propellers, and maintenance and emergency repairs of main propulsion turbines. The operation and maintenance of all types of marine boilers and their associated equipment along with U.S. Coast Guard operating regulations are covered. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Eg-265 or Eg-

261, Eg-321. Rec. 3, Cr. 3.

Eg-392: DIESEL POWER II - Continuation of material from Eg-292, with emphasis on theory and operation of air intake systems, fuel injection systems, governors, and lubrication systems. Characteristics of available lubricants and factors affecting lubrication and combustion are covered in detail. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Eg-292 or Yt-102. Rec. 2, Lab. 2, Cr. 3.

Eg-400: SPECIAL TOPICS IN ENGINEERING OPERATIONS - An upper-level course in engineering operations and related topics. Topics to be determined based on student or faculty proposals. Prerequisites to be determined based on course level and content or approval of department chair and instructor. Cr. 1-3.

Eg-422: STEAM POWER SYSTEMS II - Covers operations, testing, and components of steam power plants through lectures and laboratories that include work with a steam plant simulator and an operating steam plant. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Eg-382, and Et-371 or Es-371. Rec. 2, Lab. 2, Cr. 3.

Eg-426: STATIONARY DIESEL POWER SYSTEMS - A study of diesel engine principles, construction, and operation with concentration on diesel engines used for power generation. Rec. 2, Lab. 3, Cr. 3.

Eg-431: GAS TURBINES - The design, operation, and maintenance of marine and industrial gas turbines and their systems. Prerequisites: Et-211 and Eg-321. Rec. 3, Cr. 3.

Eg-442: ADVANCED WELDING - The theory and practice of specialized types of welding such as tungsten inert gas, aluminum, and pipe welding. Includes specialized fabrication problems encountered aboard ship. Prerequisite: Eg-243. Lab. 3, Cr. 1.

Eg-481: MARINE REFRIGERATION AND AIR CONDITIONING - Refrigeration processes encountered in the marine field and industry. Includes the design, operation, and maintenance of the principal refrigeration cycle components, reciprocating and rotary centrifugal compressors, and the refrigerants used. Prerequisite: Et-211 or Es-251. Rec. 2, Lab. 1, Cr. 2.5.

Eg-491: DIESEL POWER III - A review of marine diesel engines of all types including the design, operation and maintenance, indicator card analysis, and emergency repair of large diesel engines. Prerequisite: Eg-392. Rec. 2, Lab. 2, Cr. 3.

Eg-492: DIESEL POWER III (NO LAB) - A review of marine diesel engines of all types including the design, operation and maintenance, indicator card analysis, and emergency repair of large diesel engines. Prerequisite: Eg-392. Rec. 2, Cr. 2.

Eg-495: DIESEL ENGINE FUNDAMENTALS - Designed to give the deck officer an understanding of the operation and theory of diesel machinery. Rec. 3, Cr. 3.

Eg-497: POWER ENGINEERING OPERATIONS CAPSTONE I - The course will introduce concepts of power plant operations, which build on previous PEO curriculum material. This will include fossil power plant operations and technologies, electrical grid operation and current topics of interest in the power generation industry. This course is a communications intensive course. Prerequisites: Eg-382 and Eg-431. Rec. 3, Lab. 2, Cr. 4.

Eg-498: POWER ENGINEERING OPERATIONS CAPSTONE II - The course will develop concepts of power plant operations, which build on previous PEO curriculum material. This will include combined cycle power plant operations and technologies, environmental considerations, professional ethics and current topics of interest in the power generation industry. This course is a communications intensive course. Prerequisite: Eg-497. Rec. 3, Lab. 2, Cr. 4.

## ENVIRONMENTAL

En-201: UNDERSTANDING CLIMATE CHANGE – This interdisciplinary course investigates the interaction of major factors that influence global climate. Students will examine evidence that supports and refutes climate change due to human activity and related effects on the biosphere. The course also addresses strategies to minimize or adapt to changes in climate and their affects on global physical, social, and biological landscapes. Content relevant to each student's major is included. Rec. 3, Cr. 3.

## ENGINEERING

Es-180: ENGINEERING DESIGN I - A first course in "structured" conceptual design of engineering systems. Lectures emphasize methods of creating alternate approaches to solve a given "open ended" engineering problem, and identifying the most promising solutions. This communications intensive course includes a conceptual design project and simple computer application. Students will work in design teams devising, evaluating, and defending a feasible solution to a design problem. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Cs-150 or taken concurrently. Rec. 2, Cr. 2.

Es-205: ENGINEERING STATICS - The study of forces applied to structures. Includes an introduction to vector mechanics, static equilibrium, two and three-dimensional force systems, distributed forces, and friction. Structures studied include trusses, frames, and beams. Prerequisites: Ms-110 or Ms-150 and Ps-102 or Ps-162. Rec. 3, Cr. 3.

Es-235: ENGINEERING STRENGTH OF MATERIALS - A study of stresses and strains in structures due to tension, compression, shear, torsion, bending, and combined stresses. Stress transformation and introduction to three-dimensional stresses. Applications include beams, columns, and indeterminate structures. Prerequisite: Es-205. Rec. 3, Cr. 3.

Es-245: ENGINEERING FLUID MECHANICS - An engineering-level extension to Et-201 Fluid Power. Topics include fluid statics and dynamics as applied to ship stability, series and parallel pipe flow, open channel flow, and inviscid flow around solid objects. Application of curve fits and dimensional analysis to experiment design and data reduction. Prerequisites: Et-201, Es-205, Ms-252. Rec. 3, Cr. 3.

Es-251: ENGINEERING THERMODYNAMICS I - Introduction to thermodynamic properties, phases, and processes and the concepts of energy, work, and heat. The First and Second Laws of Thermodynamics are developed. Entropy and availability are developed through Second Law analysis. Computer application and problem solving are emphasized and design and open-ended problems are presented as design experiences. Prerequisites: Ms-110 or Ms-150, Ps-102 or Ps-162, and Cs-150. Rec. 3, Cr. 3.

Es-352: ENGINEERING THERMODYNAMICS II - Engineering applications of the First and Second Laws of Thermodynamics, entropy and availability to the following topics: analysis of power and refrigeration cycles, gas mixtures, psychometrics and flow through nozzles, and blade passages, and combustion processes. Heat transfer principles are introduced. Engineering design and computer applications are emphasized. Prerequisites: Es-251, Ms-120 or Ms-160, and Ps-201 or Ps-261. Rec. 3, Cr. 3.

Es-371: ENHANCED ELECTRICAL POWER I - An expanded version of Et-371, for students planning to take the Engineering-in-Training (EIT) examination. Includes additional topics in AC and DC circuit theory, transient analysis in DC circuits, Norton's and Thevenin's Theorems, loop current and node voltage analysis, and complex notation analysis of AC circuits. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Ps-201 or Ps-261, Ms-110 or Ms-150. Rec. 3, Lab. 2, Cr. 4.

Es-380: ENGINEERING DESIGN II - A second course in engineering design, integrating "engineering science" to design the optimum embodiment of a selected concept. Topics and techniques discussed include sensitivity analysis, engineering project management, cost estimation and reduction, design for assembly, and design for reliability/maintainability. This communications-intensive course includes computer modeling and analysis and a significant design project. Prerequisites: Es-180, Cs-150, Ms-252; or consent of instructor. (Students are expected to have completed or to be taking Et-230/Es-235 and Es-245 concurrently.) Rec. 3, Cr. 3.

Es-400: SPECIAL TOPICS IN ENGINEERING - An upper-level course in engineering design or related topics. Topics to be determined based on student or faculty proposals. Prerequisites to be determined based on course level and content or approval of department chair and instructor. Cr. 1-3.

Es-420: ENGINEERING DYNAMICS - A vector-based study of linear and angular kinematics, linear and angular kinetics, energy methods, impulse, momentum and kinetics of simple three dimensional motions. Prerequisites: Es-205 and Ms-260. Rec. 3, Cr. 3.

Es-425: ENGINEERING DYNAMICS II - An upper-level course in engineering mechanics. Topics include a detailed study in the kinematics and kinetics of a rigid body, vibration theory, Lagrangian mechanics, and the Hamiltonian function. Application of these techniques to the solution of practical engineering problems will be emphasized. Prerequisite: Es-420. Rec. 3, Cr. 3.

Es-430: MACHINE DESIGN - Application of the basic concepts of engineering statics, strength of materials, and dynamics to the design of machine elements. Analytical and empirical techniques are presented for the design and analysis of a variety of

mechanical components including fasteners, springs, bearings, gears, shafts and couplings. Lubrication principles are introduced through bearing analysis. Prerequisites: Es-235 and Es-420 or permission of the instructor. Rec. 3, Cr. 3.

Es-490: NUMERICAL AND COMPUTER METHODS FOR ENGINEERING - A variety of numerical algorithms and techniques which may be employed in the solution of engineering problems. Topics may include solution of nonlinear equations, zeroes of polynomials, interpolation and approximation, curve fitting, numerical differentiation and integration, matrix manipulations, linear simultaneous equations, solution of first and higher order (and systems of) differential equations, finite difference approximation for derivatives, and mathematical modeling. Prerequisites: Cs-150, Ms-252; Es-380 (concurrent). Rec. 3, Cr. 3.

Es-491: INTRODUCTION TO RELIABILITY ENGINEERING - This course investigates the relationship between design, manufacture, and the likelihood of failure at the component and system levels. Topics include a study of reliability mathematics, reliability testing, risk analysis, human factors, design of experiments, and reliability management. Application of these techniques to the solution of marine systems problems will be emphasized. Prerequisites: Es-380 and Ms-260. Rec. 3, Cr. 3.

Es-501: ENGINEERING MATERIALS - An introduction to the structure and structural characteristics of materials used in engineering, including metallic alloys, ceramics, polymers, and composites. Methods of processing are emphasized. Prerequisites: Et-230 or Es-235 and Ch-301 or Ch-352. Rec. 3, Cr. 3.

Es-510: ENGINEERING TEST LABORATORY - A laboratory experience through which students learn the basics of engineering testing. This communications-intensive course includes experiment design, instrument selection and calibration, data collection, analysis of data, and report writing and presentation. Prerequisites: Es-235, Es-245, Es-251. Lab. 3, Cr. 2.

Es-520: APPLICATIONS IN ENGINEERING PROGRAMMING - An upper-level course in engineering programming. This course introduces engineering students to solving complex engineering problems using computational tools. General computational and numerical techniques are explored using Matlab computational software. Other programming tools will also be utilized when appropriate. Implementation of numerical integration, numerical control, data acquisition, filtering and FFT's, FEA, CFD and CNC applications may comprise topics for this course. Prerequisite: Es-490. Rec. 3, Cr. 3.

Es-598: CAPSTONE DESIGN PREPARATION - Preparation for the major design project required in the final semester of all Marine Systems Engineering students. Each student or student team will work with an engineering faculty member to select a problem, collect reference materials, develop design objectives and specifications, select a design approach and methodology, and devise a detailed project plan. This course is communications intensive. (In special cases, course requirements may be satisfied through independent study.) Prerequisite: Marine Systems Engineering final year status or permission of the major Coordinator. Rec. 1, Cr. 1.

Es-599: CAPSTONE DESIGN PROJECT - A communications-intensive project course in which the student, individually or as part of a team, applies his/her knowledge of engineering operations, engineering science, engineering design, and technical communications to analyze and create, communicate, and defend design solutions to an open-ended problem of practical interest approved by an engineering faculty member. Prerequisite: Es-598. Rec. 1, Cr. 3.

## ENGINEERING TECHNOLOGY

Et-101: GRAPHICS - Study and practice in lettering, use of tools, methods of geometric construction, multiview projection, orthographic representation, and delineation applied to marine technology and engineering. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 2, Lab 2, Cr. 3.

Et-201: FLUID POWER - An introduction to applied fluid mechanics, including properties, hydrostatic pressure, flow and pressure, flow and pressure measurements, forces on areas, continuity equation, Bernoulli and general energy equations, analysis of piping systems for losses, and pump selection. These principles are applied to a variety of typical engineering problems in fluid systems. This course is designed to develop each student's ability to analyze engineering problems. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Ms-101 and Cs-150 (or equivalent). Rec. 2, Lab. 2, Cr. 3.

Et-202: STATICS AND DYNAMICS - Study of static force systems, equilibrium, friction, and moments, and their application to structures, including trusses. Also includes study of simple dynamic systems, including kinematics of rectilinear and angular motion, force and inertia, work, energy, and power, the basics of oscillatory motion, and impulse and momentum. Prerequisites: Ms-110 or Ms-150, Ps-102 or Ps-162. Rec. 4, Cr. 4.

Et-211: THERMODYNAMICS I - An introduction to heat and work processes that covers units, properties, energy, and the first and second laws of thermodynamics applied to ideal gas and steam processes. Prerequisite: Et-201. Rec. 3, Cr. 3.

Et-212: THERMODYNAMICS II - Power and refrigeration cycles, heat transfer, and contemporary problems in energy conversion. Prerequisite: Et-211. Rec. 2, Lab. 2, Cr. 3.

Et-230: STRENGTH OF MATERIALS - Study of stresses and strains produced in materials due to tension, compression, shear, and torsion. Prerequisite: Et-202. Rec. 3, Cr. 3.

Et-351: THERMO/FLUIDS LABORATORY - Experiments in thermodynamics, heat transfer, and fluid mechanics, standard experimental techniques, data analysis, and report writing. Communications intensive. Prerequisite: Et-211. Lab. 3, Cr. 2.

Et-362: NATURE AND PROPERTIES OF MATERIALS - This course introduces materials used in engineering applications along with guidelines for determining the appropriate materials for a given application. It also introduces fundamental science that determines the properties of materials, such as bonding types and atomic/molecular structures. Mechanical and physical properties of materials will be examined in the lectures and in laboratory exercises. Includes standard experimental techniques, mechanical and computerized data acquisition and analysis, and report writing. Communications intensive. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Ch-301, Et-230, and Et-452. Rec. 2, Lab. 2, Cr. 3.

Et-371: ELECTRICAL POWER I - Extension of electromagnetic principles to AC and DC circuits, including balanced three-phase AC, and their application to the analysis of DC and AC circuits. Includes meters, transformers, batteries, and three-phase AC. Introduction to practical operation of shipboard and industrial electrical systems. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Ps-201 or Ps-261. Rec. 3, Lab. 2, Cr. 4.

Et-377: ENGINEERING ECONOMICS - A study of economic theories and principles as applied to engineering decision making. It includes methods of compound interest, annual worth, and present worth, rate of return, benefit/cost ratio, capital allocation, depreciation, and risk analysis. Other topics will include revenue requirements, price level changes, and minimum attractive rate of return. Rec. 3, Cr. 3.

Et-378: COMPUTER APPLICATIONS FOR POWER - A practical study of typical engineering software used in industry. Examples include the use of spreadsheet for economic studies, computer aided drafting, power plant controls, moving data from one analysis to another, and special topics chosen by the instructor. Prerequisite: Cs-150. Rec. 2, Lab. 3, Cr. 3.

Et-390: ADVANCED TECHNOLOGY FOR SURFACE TRANSPORTATION SYSTEMS - A course covering high technology innovations in engines, electronics, and hydraulic systems as applied to modern road and rail vehicles, and including computerized vehicle management systems that optimize vehicle performance and handling. Prerequisites: Ps-201, Eg-392, and Et-371 or Es-371. Rec. 3, Cr. 3.

Et-399: SPECIAL TOPICS IN ENGINEERING TECHNOLOGY - An upper-level course in engineering technology and related topics. Topics to be determined based on student or faculty proposals. Prerequisites to be determined based on course level and content or approval of department chair and instructor. Cr. 1-3.

Et-401: AUTOMATION AND CONTROL - A study of principles and hardware for control and automation systems as applied to processes in marine and shoreside power plants. Media studied include pneumatic, hydraulic, mechanical, and electrical/electronic. Prerequisites: Eg-372, Ce-203 or Co-200 or Co-201 or Co-203. Rec. 3, Cr. 3.

Et-432: POWER CONTROL ELECTRONICS - Operational theory, applications and troubleshooting of basic electronic components used to control electrical power, including thermionic tubes, CRTs, diodes, transistors, SCRs and related components. Circuits studied include rectifiers, oscillators, amplifiers, inverters, stabilized power supplies, counters, sensors for speed, motion and position, logic circuits, memories and Bistable devices. Applications are taken from automation, AC and DC control circuits, battery charging systems and power supplies, microwave ovens, communications and digital logic and memory systems. Prerequisite: Eg-372. Rec. 3, Cr. 3.

Et-452: TECHNICAL COMMUNICATIONS - Extension of the theory and practice of communications tasks of a working engineer or technologist, including engineering proposals and reports; mechanism and process description; instructions, accident or casualty reports; technical specifications; and progress reports. Application of effective visual aids to both oral and written

communications will be emphasized. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Et-455: ENGINEERING ETHICS: CONCEPTS - A preparatory course for engineers in formulating decision-making guidelines and solving technical problems while considering ethical ramifications. Includes professionalism and codes of ethics as related to moral and virtue issues. Responsibility of engineers as well as risk safety and liability associated with decision-making processes as they affect the environment and societal norms are also included. Prerequisite: senior standing or permission of the instructor. Rec. 3, Cr. 3.

Et-482: HEATING, VENTILATION, & AIR CONDITIONING - A study of the components, functions, and operating principles of an air conditioning system with particular attention focused on the influence of temperature, humidity, and air motion as related to human comfort. Topics include psychometrics, air quality, capacity calculations for heat gain and loss, air distribution, and elementary refrigeration systems. Rec. 2, Cr. 2.

Et-491: MARINE ENGINEERING TECHNOLOGY CAPSTONE I – A course in which the student, individually, applies his/her knowledge of engineering operations and engineering science to gather and interpret information from the TVSOM operating power plant and defend a written project. This project will draw together diverse elements of the curriculum to develop student competence in focusing both technical and non-technical skills in solving problems. This course may also require the student to work as part of a team to collect certain data and/or other information to support their individual project, as well as the team project that is part of MET Capstone II. Prerequisite: Ce-303. Rec. 1, Cr. 1.

Et-492: MARINE ENGINEERING TECHNOLOGY CAPSTONE II – A course in which a student as part of a team, applies his/her knowledge of engineering operations, engineering science, and technical communications to orally defend and report on collected data from the TVSOM operating power plant. This project will draw together diverse elements of the curriculum to develop student competence in focusing both technical and non-technical skills in solving problems. Prerequisite: Et-491. Rec. 1, Cr. 1.

Et-498: POWER ENGINEERING TECHNOLOGY CAPSTONE I - A course in which the student, individually, applies his/her knowledge of computer methods, engineering operations, engineering science and technical communications to analyze, create, communicate and defend a written technical project. Additionally, the course will introduce concepts of power plant operations, which build on previous PET curriculum material. This will include fossil power plant operations and technologies, using a power plant simulator, electrical grid operation and current topics of interest in the power generation industry. This course is a communications intensive and computer intensive course. Prerequisites: Et-378, Eg-382 and Eg-431. Rec. 3, Lab. 2, Cr. 4.

Et-499: POWER ENGINEERING TECHNOLOGY CAPSTONE II - A course in which the student, individually, and as part of a team, applies his/her knowledge of computer methods, engineering operations, engineering science and technical communications to analyze, create, communicate and defend a written project. At least one formal presentation will be included in this project. Additionally, the course will develop concepts of power plant operations, which build on previous PET curriculum material. This will include combined cycle power plant operations and technologies, using a power plant simulator, environmental considerations, professional ethics and current topics of interest in the power generation industry. This course is a communications intensive and computer intensive course. Prerequisite: Et-498. Rec. 4, Lab. 2, Cr. 5.

## GEOGRAPHY

Ge-200: WORLD REGIONAL GEOGRAPHY I - This course surveys the physical, economic, and historical patterns of the U.S., Canada, Latin America, Europe, Russia, and states of the former Soviet Union. Each of these regions will be explored with respect to landforms, resources, and cultures, as well as evolving economic and political systems. Rec. 3, Cr. 3.

Ge-210: WORLD REGIONAL GEOGRAPHY II - This course surveys the physical, economic, and historical patterns of the Middle East, North Africa, Asia, Japan, Australia, New Zealand, and the Pacific Islands. Each of these regions will be explored with respect to landforms, resources, and cultures, as well as evolving economic and political systems. Rec. 3, Cr. 3.

## HUMANITIES AND COMMUNICATIONS

Hc-111: COMPOSITION - This course helps students develop a flexible writing process that can be applied to a variety of rhetorical situations. Critical thinking and argumentation are emphasized and basic research skills are introduced. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Hc-112: HUMANITIES I - An interdisciplinary examination of the cultural roots of modern global society from the first

civilizations through the middle Renaissance. Prerequisite: Hc-111. Rec. 3, Cr. 3.

Hc-151/152/153: BAND - A campus program that aims to promote music education for students who participate and perform as musicians in the college band. Active participation in band activities and written assignments in music will be required. Cr. 1. (Students may re-elect this course in two subsequent semesters to earn a total of 3 credits which would satisfy a humanities elective requirement.)

Hc-160 – Hc-191: FOREIGN LANGUAGES – Rosetta Stone.

Foreign Language Level I – Online course. Introductory level includes the basics of the language with equal emphasis on developing reading, listening, writing, and speaking skills. For students with no previous study of the language or fewer than 2 years in high school. Cr. 3.

Foreign Language Level II – Online course. Intermediate level includes a systematic, but gradual review of the essentials of grammar and strengthens reading, writing, and especially speaking skills. Cr. 3.

Hc-200: AMERICAN LITERATURE - A seminar course that will investigate major authors, themes, and works of American literature. Students will participate in class discussions and present individual projects. Rec. 3, Cr. 3.

Hc-211: HUMANITIES II - An interdisciplinary examination of the cultural roots of modern global society from the late Renaissance to the present. Prerequisite: Hc-111. Rec. 3, Cr. 3.

Hc-232: MANAGEMENT COMMUNICATION - Students apply basic writing skills to produce various types of business communication, such as short and long reports, letters of inquiry, transmittals, proposal preparation, and organization of information for oral presentation using modern technological communication systems. Prerequisite: Hc-111. Rec. 3, Cr. 3.

Hc-300: INDEPENDENT STUDY - An independent research project or course to be arranged between the instructor and advanced student pursuing a humanities minor. Regular seminar meetings and an extensive research project required. Prerequisite: permission of instructor and advisor. Rec. 3, Cr. 3.

Hc-311: TECHNOLOGY AND SOCIETY I - A survey of the history of technology and an examination of the impact of inventions and innovations on Western society from ancient times to the present. Rec. 3, Cr. 3.

Hc-312: TECHNOLOGY AND SOCIETY II - An examination of the ethical and organizational impacts of technology on contemporary society. Course topics include ethical standards; the nature, sources and effects of technological change; the relationship of science to technology; the diffusion of technology; technology, energy and the environment; technology and the transformation of work; and the shaping and control of technology. The impacts of specific technologies, such as communication and medical technologies are also examined. Rec. 3, Cr. 3.

Hc-321: EXPERIENCE, HISTORY, AND ANALYSIS OF FILM - This course traces historical developments in film production (including types of framing, the introduction of camera motion, lens effects, the introduction of sound, etc.) and shows how these techniques lead to cinematic meaning. Rec. 3, Cr. 3.

Hc-331: SPECIAL TOPICS IN HUMANITIES - An upper-level course allowing students to pursue various topics in the humanities. Topics might include: thematic or imagistic studies, or work of specific genres, or individual authors, philosophers, composers and/or artists. Proposals may be student or instructor initiated. Prerequisites: Hc-112 and Hc-211 and approval of department chair and instructor. Rec. 3, Cr. 3.

Hc-333: BASIC DRAWING - This course helps students understand the language of drawing, a means of communicating literal or imaginative pictorial ideas. Students will develop a vocabulary for drawing, and learn how to accurately represent on paper what one sees. This course will stress learning about the power of line, and perspective on a 2 dimensional surface so the work tells the viewer what the artist wants to say and that the drawing aspires to be art rather than a diagram. Rec. 3, Cr. 3.

Hc-334: ETHICS AND SCIENCE - This course will examine a number of contemporary social issues that are scientific in nature and present ethical dilemmas. It begins by examining the nature of ethics and a description of an ethical dilemma. This is followed by readings that explore the development of three major ethical philosophies. While developing these ethical systems, the scientific background of several controversial issues is also examined. Students are then asked to propose solutions to the controversies using ethical reasoning and scientific fact. Topics will be current and varied. Prerequisites: Hc-111. Rec. 3, Cr. 3.

Hc-339: PHOTOGRAPHY - This course is an introduction to the art and science of photography. Primary emphasis is placed

on photographic fundamentals and skill development in the use of the 35mm camera and in printing photographs in the black-and-white darkroom. Principles and essentials for users of digital technology are also included. Attention to composition is stressed. Rec. 3, Cr. 3.

## HISTORY

Hy-260: AMERICAN HISTORY 1500 - 1877 - Beginning with early civilizations in North America, this course recounts the settlement of the continent, the colonial and revolutionary periods, the early national period, sectionalism, the Civil War and Reconstruction. Rec. 3, Cr. 3.

Hy-270: AMERICAN HISTORY 1877 TO THE PRESENT - This course examines both the internal growing pains of American society beginning in 1877 as well as the sometimes rocky U.S. rise to global power, tracing the country's initial reluctance to enter world affairs to its status, at the end of the twentieth century, as the cultural, political, and economic leader of the world – the last superpower. Rec. 3, Cr. 3.

Hy-300: PUBLIC HISTORY - This course looks at the presentation of historical information in popular culture. Through film, historical novels, museums, monuments, and web sites, students will examine the nature of the information provided and learn to critically evaluate the quality of what is presented. Prerequisite: Either Hy-210, Hy-220, Hy-260, Hy-270, or permission of the instructor. Rec. 3, Cr. 3.

Hy-310: CIVIL WAR AND RECONSTRUCTION - The American Civil War still stands as the most destructive in this nation's history. Resolving issues left untouched by the Declaration of Independence, the Revolutionary War, and the Constitution, the Civil War was a bitter and bloody fight to define and extend rights promised by the Founding Fathers. This course examines events leading to war, four years of armed conflict, and the Reconstruction period. Prerequisite: Either Hy-260, Hy-300, or permission of instructor. Rec. 3, Cr. 3.

Hy-335: THE ATLANTIC WORLD: 1400-1825 - The events and processes initiated by the Christopher Columbus's voyage in 1492 transformed the world. The Atlantic Ocean – obstacle, frontier, and highway – connected and continues to shape the cultures and societies created by this Columbian exchange. This course examines the circumstances of European encounters with Africa and America, beginning with European voyages of exploration through the abolition of the slave trade in the nineteenth century. Rec. 3, Cr. 3.

Hy-360: TWENTIETH-CENTURY AMERICA - Frequently called "The American Century" the years 1900 to 2000 mark a time of immense change for the United States, both domestically and internationally. This course examines the evolution of America from involvement in WWI, through the Great Depression, WWII, the Cold War, the fall of the Soviet Union, and the end of the millennium. Prerequisite: Either Hy-260, Hy-270, Hy-300, Hy-310, or permission of the instructor. Rec. 3, Cr. 3.

## LIFELONG LEARNING

LI-101: 100 TON MASTER/MATE - For operating on Inland or Near Coastal Waters. The 90 Hour Captain's and Mate's License course combines classroom time with on the water practical training. The course is broken down into three modules: Rules of the Road, General Subjects and Navigation. Classroom time yields officer level training covering a broad range of topics, including hands-on chart work, and training in the use of reference materials. Seamanship, sea rescue maneuvers, emergency drill procedures, and performing USCG vessel inspections are also covered in the classroom. Prerequisites: Permission of the instructor. Rec. 2, Cr. 2.

LI-102: MARITIME SECURITY FOR MILITARY, FIRST RESPONDERS AND LAW ENFORCEMENT PERSONNEL - This two day course is designed to provide military, first responder and law enforcement personnel with an understanding of enhancements to security in the maritime arena and the unique circumstances and operational conditions that prevail therein. Those who successfully complete the course should better be able to undertake their duties and responsibilities in the port, maritime and intermodal context. Direct observation of Academy waterfront security procedures will enhance classroom lectures. Students who successfully complete the course will receive the relevant USCG approved course certificate. Prerequisite: permission of the instructor. Rec. 0.5, Cr. 0.5.

LI-103: VESSEL AND COMPANY SECURITY OFFICER COURSE - This three and one-half day course provides the information necessary to those who may be designated to perform the duties and responsibilities of a Company Security Officer and/or a Vessel Security Officer. Content includes the duties and responsibilities with respect to the security of a ship, for ensuring the development of a ship security assessment, for developing, implementing, maintaining and updating a Ship Security Plan, and for coordinating with Vessel, Company and Facility Security Officers. Those who successfully complete this course should be able to undertake the duties and responsibilities of a Vessel or Company Security Officer and will receive the relevant USCG approved

course certificate for each position. Prerequisite: Permission of the instructor. Rec. 0.5, Cr. 0.5.

LI-104: FACILITY SECURITY OFFICER - This three and one-half day course provides the knowledge necessary to those who may be designated to perform the duties and responsibilities of a Facility Security Officer and in particular, the duties and responsibilities with respect to the security of a port facility, for ensuring the development of a Facility Security Assessment, for ensuring the development, implementation, maintenance, and updating of a Facility Security Plan and for coordinating with Vessel Security Officers and with Company Security Officers. Those who successfully complete this course should be able to undertake the duties and responsibilities as Facility Security Officer and will receive the relevant USCG approved course certificate. Prerequisite: Permission of the instructor. Rec. 0.5, Cr. 0.5.

LI-105: INTERNATIONAL MARITIME SECURITY LAW - This five day course examines the important and rapidly developing regime of maritime security in international law, with emphasis upon measures to combat the proliferation of weapons of mass destruction (WMD) as well as terrorism, piracy and other violent criminal acts in the maritime domain. A brief history of the subject will be followed by an exposition of the applicable principles of customary international law as these apply to Flag States and Coastal States as well as persons. The growing body of conventional international law and the international organizations involved in this development will be reviewed, as will the problems of and a variety of strategies for national enforcement of international maritime security law. Finally, the implications for the future of international maritime transport will be discussed. Prerequisite: Permission of the instructor. Rec. 1, Cr. 1.

**NOTE:**

Lifelong Learning ("LI") courses are offered through the [Office of Continuing Education](#).

**LOGISTICS**

Lo-200: IBL COOPERATIVE INDUSTRIAL FIELD EXPERIENCE - See Cooperative Education course listings.

Lo-301: BUSINESS LOGISTICS - An introduction to the field of business logistics and with a focus on inventory and its various components such as materials management, physical distribution, traffic management, warehousing, purchasing, inventory management, outsourcing, and logistics organization; an exposure to current trends and developments in logistics management. Also includes study of inventory management, including consideration of automated information and smart-buying techniques; distribution centers, warehousing, plant location, including optimization techniques and transport mode considerations. The course will serve as a complement to Lo-313 and a base for upper level logistics courses. Prerequisites: Ma-101, Ma-211, and junior standing or department chair permission. Rec. 3, Cr. 3.

Lo-313: FREIGHT TRANSPORTATION - Theory and case analysis pertaining to modal, intermodal and multimodal freight transportation with coverage of road, rail, air and water modes of transportation. Course focuses on the role of transportation in the logistics and supply chain processes including industry structure, capabilities, financial performance, key player analysis, and the contractual and pricing interface between shippers and carriers. Prerequisites: Ma-101, Ma-211, and junior standing or department chair permission. Rec. 3, Cr. 3.

Lo-334: GLOBAL PURCHASING AND MATERIAL HANDLING - Acquisition of necessary goods, materials and services in exchange for funds or other remuneration. Locating qualified vendors, seeking alternative sources, and negotiating favorable terms are considered. Emphasis is placed on contemporary and emerging strategic considerations such as partnering with suppliers to design, develop and service product lines, and establishment of long-term prime vendor contracts. Also includes study of the material handling and packaging for goods and materials in the warehouse, production operation, and related inbound and outbound transportation. Prerequisites: Ma-101, Ma-211, and junior standing or department chair permission. Rec. 3, Cr. 3.

Lo-400: CO-OP EDUCATIONAL EXPERIENCE IN IBL - See Cooperative Education course listings.

Lo-411: LOGISTICS INFORMATION SYSTEMS - Introduction to the application of information technology in logistics organizations, roles of managers and staff professionals in developing and using information systems based on current and future technology. Includes using computer packages Microsoft Access, Microsoft Visio, Microsoft Map Point, and Microsoft Excel to solve logistics and transportation problems, and study of logistics related technologies using electronic data interchange and electronic identification systems. Prerequisites: Lo-301, Ma-101, Ma-211, and senior standing or department chair permission. Rec. 3, Cr. 3.

Lo-422: INTERNATIONAL LOGISTICS - A study of the various components of international logistics system such as import/export procedures and documentation, international commercial and payment terms, world shipping markets, air and ocean freight management, third party logistics service providers, and cargo and financial risk management issues. Prerequisites: Lo-301, Ma-101, Ma-211, and senior standing or department chair permission. Rec. 3, Cr. 3.

Lo-432: STRATEGIC SUPPLY CHAIN MANAGEMENT - The study of logistics and supply chain potential future shifts and the drivers for those changes. Explores current events in supply chain, structural issues, and development of future direction, options and alternatives with roles that current students may play in that environment including inter-firm logistics integration, planning, sourcing, production, order management, distribution, administration, and customer relations that can be strategically harnessed to leverage strategic competitive advantage across multiple companies. Includes integrated supply chain metrics and performance measurement. The case method will be used to provide experience in integrating material from this and prior courses in the International Business and Logistics program. Prerequisites: Lo-301, Lo-313, Lo-332, Ma-101, Ma-211, and senior standing or department chair permission. Rec. 3, Cr. 3.

## MANAGEMENT

Ma-101: INTRODUCTION TO BUSINESS & SUPPLY CHAIN MANAGEMENT - A foundation course that provides an overview of the fundamentals of business management in the context of global logistics and supply chain. It includes a conceptual framework for the managerial functions and challenges within and between companies in the creation and distribution of tangible goods, as well as the nature of contemporary business, current issues, and career opportunities. Rec. 3, Cr. 3.

Ma-211: FINANCIAL ACCOUNTING - An introduction to the preparation, use, and analysis of the four basic financial statements with an emphasis placed on the study of various financial transactions. Prerequisite: Sophomore standing or department chair permission. Rec. 3, Cr. 3.

Ma-222: MARKETING MANAGEMENT - Focuses on the process of creating and fulfilling consumer and organizational needs through strategies involving the conception, pricing, promotion and distribution of ideas, goods and services in a market economy. The interrelationship of planning and marketing is explored throughout the course. Prerequisites: Ma-101, and sophomore standing or department chair permission. Rec. 3, Cr. 3.

Ma-242: MANAGERIAL ACCOUNTING - An introduction to management decision making involving such topics as: cost/volume relationships, budgets and variances, the allocation of costs, and job costing and process costing. Prerequisite: Ma-211, and sophomore standing or department chair permission. Rec. 3, Cr. 3.

Ma-303: FINANCIAL MANAGEMENT - An introduction to the study of asset pricing, risk management, project evaluation, and debt and dividend policies. Prerequisites: Junior standing or department chair permission. Rec. 3, Cr. 3.

Ma-312: PRODUCTION AND OPERATIONS MANAGEMENT - Building and managing world-class operations through Total Quality Management; designing, building, planning, and controlling Fast Response Organizations including demand management, process design, capacity strategy, facility location and layout, inventory management, performance measurement, and global enterprise integration. Prerequisites: Ma-101, Ma-211, and junior standing or department chair permission. Rec. 3, Cr. 3.

Ma-332: BUSINESS LAW - Course will examine elements of business law including its ethics and the U.S. judicial system. Topics to be covered include contract and employment law, business regulations, and corporate governance issues, and related case studies. Prerequisites: Ma-101 and junior standing or department chair permission. Rec. 3, Cr. 3.

Ma-342: INTERNATIONAL HUMAN RESOURCE MANAGEMENT - Students examine the challenges in managing and motivating a multicultural work force in the globally interconnected economy. Topics such as legal, cross-cultural issues, motivation, job analysis, recruitment, staffing, performance appraisal, and compensation systems are explored. Prerequisites: Ma-101 and junior standing or department chair permission. Rec. 3, Cr. 3.

Ma-401: ORGANIZATIONAL BEHAVIOR - This course introduces students to the processes and stakeholders that characterize and create the dynamics of contemporary organizational life. Topics such as organizational culture, conflict, group interaction, and structure are addressed from both a theoretical and "real world" perspective. Relevant case studies are considered to develop and broaden insight and analytical skills that are vital to manage, navigate, and lead organizations through change and growth. Prerequisites: Lo-400, and senior standing or department chair permission. Rec. 3, Cr. 3.

Ma-403: INTERNATIONAL BUSINESS - An introductory survey course to doing business globally. Course will focus on country differences, theories and issues in cross-border trade and investment, and global monetary system and competing in the global marketplace, with special emphasis on entry strategies and modes. Prerequisites: Ec-102, Ec-201, Ma-211, Ma-303, and senior standing or department chair permission. Rec. 3, Cr. 3.

Ma-421: INTERNATIONAL MARKETING - This course focuses on the theory and practice of marketing across national borders with special emphasis on the development of appropriate marketing strategies that target a country or countries within a selected region of the world. Students review historical, cultural, technological, risk and security, and socioeconomic variables that

influence marketing decision-making. The course involves a final integration project and presentation based on case study and review of the region that is under consideration. Prerequisites: Ec-102 or Ec-201, Ma-222, and junior standing or department chair permission. Rec. 3, Cr. 3.

Ma-422: INTERNATIONAL BUSINESS LAW - The role of law in transnational commerce; traditional business law subjects (sales, commercial paper, etc.) as well as environmental subjects (trade regulations, employment, ethics, and others) are studied to assist managers in competing successfully in competitive global markets through development of skills to make judgments about the political and business risk of doing business internationally. Prerequisites: Ma-332, Ma-403, and senior standing or department chair permission. Rec. 3, Cr. 3.

Ma-470: FREE ENTERPRISE SERVICE LEARNING - A community outreach program that aims to promote free enterprise and business principles while enhancing written and oral communication, leadership, self-discipline, and teamwork skills. Will provide hands-on learning experience for students in business and economics, and also opportunities to network with local and national business leaders. Students in Free Enterprise involvement and project team participation required. Approval by department chair is required. Cr. 0.5-4.

Ma-498: SPECIAL TOPICS IN INTERNATIONAL BUSINESS AND LOGISTICS - A course allowing students to pursue advanced topics of international business and logistics not offered in the curriculum. Topics of study will depend on the interests of the student and supervising faculty member(s). Approval by department chair is required. Cr. 1-3.

## MEDICINE

Md-310: MEDICAL CARE PROVIDER - A study of the assessment, recognition and treatment of various diseases and injuries that may be encountered in the workplace. This course includes first aid, CPR and blood borne pathogens. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Md-311: MEDICAL PERSON IN CHARGE - A course including didactic and mostly practical skills. Included will be IVs, medication administration, skeletal and spinal immobilization. Prerequisite: Md-310. Rec. 3, Cr. 3.

Md-312: EMERGENCY MEDICAL TECHNICIAN - A 120-hour course which follows the DOT curriculum. This course meets twice a week and 4 complete weekend days. This course includes didactic and practical skill instruction. Upon successful completion of the course the student may take the NREMT national boards which would allow the student to apply for a Maine State EMS license to work as an EMT-B on an ambulance. Text and completion of associated workbook are required. Rec. 6, Cr. 5.

## MATHEMATICS

Ms-101: PRE-CALCULUS MATHEMATICS - Includes linear and quadratic equations, inequalities, simultaneous linear equations, matrices, graphs, composite and inverse functions, logarithmic and exponential functions, complex numbers and the complex plane, basic trigonometry, and trigonometric identities and equations. Rec. 4, Cr. 4.

Ms-102: PRE-CALCULUS, PART I - Part 1 of a 2-part pre-calculus sequence. Includes linear and quadratic equations, inequalities, complex numbers, and basic trigonometry. To be followed by Ms-103. Rec. 3, Cr. 2.

Ms-103: PRE-CALCULUS, PART II - Part 2 of a 2-semester pre-calculus sequence. Includes graphs, composite and inverse functions, simultaneous linear equations, matrices, logarithmic and exponential functions, and trigonometric identities and equations. Prerequisite: Ms-102. Rec. 3, Cr. 2.

Ms-110: TECHNICAL CALCULUS I - Differential and integral calculus of algebraic and transcendental functions; applications, including physical problems, graphing and optimization; and basic integration, indefinite and definite integrals. Prerequisite: Ms-101 or equivalent. Rec. 4, Cr. 4.

Ms-120: TECHNICAL CALCULUS II - A second course in calculus, covering further techniques of integration, calculus of transcendental functions, functions of several variables, infinite series, and an introduction to ordinary differential equations. Prerequisite: Ms-110. Rec. 4, Cr. 4.

Ms-141: FINITE MATHEMATICS - A course designed to develop the mathematical skills considered important for business students and prepare them for business calculus. Topics include: algebra review, linear functions, systems of linear equations and matrices, linear programming, the mathematics of finance, logic, sets, elementary probability and statistics, game theory, digraphs

and networks, and nonlinear functions. Rec. 4, Cr. 4.

Ms-150: CALCULUS I - Functions, analytic geometry, limits, continuity, derivatives of algebraic functions and applications; study of graphs maxima and minima, methods of approximation; and elementary integration, indefinite and definite integrals. Rec. 4, Cr. 4.

Ms-151: BUSINESS CALCULUS - A course designed to develop the mathematical skills considered important for business students. The primary emphasis is on the calculus for functions of one variable and its applications. Note: It is recommended that students planning to pursue graduate studies or those on an NROTC scholarship should take Ms-150. Prerequisite: Ms-101 or equivalent. Rec. 4, Cr. 4.

Ms-160: CALCULUS II - Applications of the integral, advanced methods of integration, analytic geometry, the calculus of transcendental functions, improper integration, conics and polar coordinates, and the introduction of infinite series and the calculus of several variables. Prerequisite: Ms-150 or permission of the Mathematics Coordinator. Rec. 4, Cr. 4.

Ms-251: PROBABILITY AND STATISTICS FOR ENGINEERING AND SCIENCE - An introductory, calculus-based course in probability and statistics with an emphasis on engineering and scientific applications. Topics include: descriptive statistics; probability (basic probability and discrete and continuous random variables and their distributions); point and interval estimation; hypothesis testing of sample means, proportions, and variances; regression models; use of statistical software. Applications will include reliability and experimental design. Prerequisites: a Computer Science course or evidence of computer literacy, and Ms-150. Rec. 3, Cr. 3.

Ms-252: ENGINEERING MATHEMATICS I - An introduction to applied mathematics useful in applied science and design engineering. Topics include infinite series formation, both functional and numerical, in pursuit of non-analytical solution, numerical techniques with emphasis on error analysis, vector calculus and linear algebra. Applications include, but are not limited to, chemical reaction, electrical circuits, curvilinear regression for experimental data, oscillatory systems, fluid force, coupled systems and mathematical modeling of dynamic systems. Use of computer generated solution is encouraged. Prerequisite: Ms-120 or Ms-160. Rec. 4, Cr. 4.

Ms-253: STATISTICS FOR BUSINESS AND MANAGEMENT - An introductory, algebra-based course in statistics with an emphasis on business and managerial applications. Topics include descriptive statistics; basic probability and random variables; point and interval estimation; hypothesis testing of sample means and proportions; linear regression and correlation; and use of statistical software. Applications will include decision making, quality management, statistical process control, and time-series forecasting models. Prerequisite: a Computer Science course or evidence of computer literacy. Rec. 3, Cr. 3.

Ms-260: DIFFERENTIAL EQUATIONS - A first course in ordinary differential equations with emphasis on analytic solution. Topics include existence and uniqueness of solution, first order equations, linear and selected nonlinear higher order equations, and solution by Laplace transforms, numerical solution and introduction to solution by series. Applications selected from mechanics, biology, thermodynamics, resonance, electrical networks, automatic control and servomechanisms, epidemiology and ecology. Mathematical formulation and design are stressed in all applications. Prerequisite: Ms-120 or Ms-160. Rec. 3, Cr. 3.

Ms-299: SPECIAL TOPICS IN MATHEMATICS - A course allowing a student to pursue topics or sequences of topics not otherwise offered. Proposals are to be student initiated, in consultation with an instructor. Prerequisite: Department and instructor approval. Rec. 1-3, Cr. 1-3.

Ms-420: GEOPHYSICAL FLUID DYNAMICS - Formulation and study of mathematical models applicable to geophysical fluid dynamics. Development of differential and integral equations of mass, momentum and energy conservation for viscous fluids in a rotating frame. Topics include perturbation theory, canonical transformations, tensor analysis, linearization, LaGrange's equations and state vectors and operators. Knowledge of vector calculus is preferred. Prerequisite: Ms-260. Rec. 3, Cr. 3.

Ms-451: ENGINEERING MATHEMATICS II - A second course in applied mathematics for applied science and design engineering students. Topics include review of eigenvectors, eigenvalues and orthogonality, Taylor series method, Picard's method of iteration, method of Frobenius, Bessel's equation, Legendre's equation, Sturm-Liouville problems, Fourier series and analysis, Gram-Schmidt orthonormalization and self-adjoint differential equations. Partial differential equations such as the heat equation, wave equation and potential equation are formulated using basic physical principles and brought to solution. The Laplacian in rectangular, cylindrical and spherical coordinates is investigated. Application to design analysis and dynamical systems is stressed. Prerequisites: Ms-252 and Ms-260. Rec. 3, Cr. 3.

## NAUTICAL SCIENCE

Ns-101: INTRODUCTION TO NAUTICAL SCIENCE - An introduction to nautical science which covers basic skills that

would put the student at the able bodied seaman level of knowledge and prepare the student for the U.S. Coast Guard lifeboat examination. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 2, Lab. 2, Cr. 2.

Ns-102: SHIP STRUCTURE - An introduction to ship construction as it relates to all types of vessels. Basic naval architecture and management functions regarding ship structure are stressed. Topics include hull structure and components, vessel design process, design stresses, tonnage measurements, and load line assignment. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Eg-101 and Ns-101. Rec. 3, Cr. 3.

Ns-122: CARGO I - A study of vessel cargo and the role of the ship in integrated transportation systems. At the introductory level topics include cargo responsibility, fundamental objectives of good stowage, and a survey of cargo gear. The role of the ship's officer is examined and related to various types of vessels and cargo operations. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Ns-131: INTRODUCTION TO MARINE TRANSPORTATION - A current overview of the maritime industry, what it consists of, how it operates, how it is characterized economically, and how it is regulated. Rec. 3, Cr. 3.

Ns-210: TANKER OPERATIONS - This course meets the USCG formal education requirements for Dangerous Liquid Cargo Person In Charge (PIC) (46cfr 13.209) and Tankerman Engineer (46 cfr 13.509). Successful completion of this course will lead to the issuance of the Dangerous Liquid Cargo Certificate and credited with 1 load & 1 discharge toward the Tankerman PIC endorsement. The presentations will highlight areas of principal concern to the junior officers, especially those necessary to minimize the possibility of accidents and pollution. Included are a detailed study of cargo handling procedures, inert gas systems and crude oil washing, and other areas associated with tank vessel operations. Rec. 3, Lab. 2, Cr. 4.

Ns-221: METEOROLOGY - Basic concepts of meteorology with particular emphasis on marine applications. This includes a study of ocean winds and weather with the plotting and analysis of weather maps, weather routing of ships, and familiarization with the various Weather Bureau publications and services. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Ns-241: SEAMANSHIP - Seamanship refers to a body of practical knowledge that is essential to creative solutions at sea, as well as to routine shipboard operations. Through labs and lectures the student will be acquainted with the information and practical skills associated with rigging, mechanical advantage, deck equipment, hardware, maintenance, and line handling and safety procedures. The course includes material appropriate to functioning as an Able Bodied Seaman, as well as to efficiently organizing the work of others. Prerequisite: Ns-101. Rec. 2, Lab 2, Cr. 2.

Ns-262: NAVIGATION RULES - The International and Inland Rules of the Road for preventing collisions at sea. This includes application, definitions, lights and shapes, steering and sailing rules with sound signals for vessels in meeting, crossing, and overtaking situations, and conduct of vessels in restricted visibility. Rec. 3, Cr. 3.

Ns-271: TERRESTRIAL NAVIGATION I - An introductory navigation course intended for all students pursuing a license for any tonnage class. The rudiments of navigation are covered in lecture format. Topics include: charts, plotting tools and techniques, dead reckoning, gyro and magnetic compasses and their errors, fixes and running fixes, set and drift, tidal and current calculations, navigation publications, and chart correcting and piloting with electronic navigation instruments. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Ns-272: TERRESTRIAL NAVIGATION LAB - Weekly exercises aboard Academy watercraft and in the Academy's Bridge and Navigation Simulator allow the student to practice the skills taught in Ns-271. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Must be taken concurrently with Ns-271. Lab 3, Cr. 1.

Ns-282: CELESTIAL NAVIGATION I - A celestial navigation course intended for students pursuing an unlimited Third Mate's license or an ocean endorsement for a limited tonnage license. This course will cover the basic practices of celestial navigation. Emphasis is placed on solutions of the various celestial navigation calculations involving the sun. Topics covered are: time from a

navigational standpoint, essentials of nautical astronomy, time diagrams, the nautical almanac, sight reduction of the sun, time of celestial phenomena, local apparent noon, noon sights, azimuths, and amplitudes of the sun. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Ns-271 and Ns-272. Rec. 4, Cr. 3.

Ns-292: ELECTRONIC NAVIGATION - Introduction to electronic navigation. Instruction in theory, practical operation, and use of R.F.D. Loran-C, GPS, and radio theory and operation of marine radar. Includes uses and interpretation of radar information, and radar plotting. Successful completion of the radar portion of this course and the follow-on course (Ns-498) leads to certification as Radar Observer as approved by the U.S. Coast Guard. Prerequisites: Must be taken concurrently with Ns-271 and Ns-272. Rec. 2. Lab. 2, Cr. 3.

Ns-301: STABILITY - Principles, terms, and procedures used in determination of transverse, longitudinal, and damage stability of ships of all sizes. Examines the physical laws affecting a floating body. Includes the effects of cargo operations, loose water, fuel consumption, grounding, and flooding on vessel stability and examines cases involving loss of stability. Calculating and adjusting trim are also covered. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Ns-102 for MTO students; Yt-105 for SVO students. Rec. 3, Cr. 3.

Ns-321: WEATHER ROUTING - This course will build on the basics of meteorology learned in Ns-221, Meteorology. The student will learn to locate, organize and interpret various weather products from commercial and government sources, including facsimile maps, internet sites and commercial weather software. The student will utilize these products to plan and execute "virtual voyages" in real-time, making vessel routing decisions for chosen vessels on fictitious voyages. Prerequisite: Ns-221. Rec. 2, Lab 2, Cr. 3.

Ns-332: MARINE COMMUNICATIONS - This course offers a comprehensive study of the various maritime communications, stressing distress and safety communications including, but not limited to: radiotelephone procedures GMDSS FCC regulations, and flag and flashing light signaling. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Ns-292. Rec. 2, Lab. 3, Cr. 3.

Ns-341: AUXILIARY SAIL VESSEL OPERATIONS - This course will prepare the student to sail as a deckhand or mate aboard an inspected auxiliary sail vessel, as well as to sit for the USCG Auxiliary Sail License Exam. (Sea experience will have to be documented by the student on his/her own time in order to qualify for the license.) The successful student who earns his/her license will be qualified to sail as mate or master on USCG certified auxiliary sailing vessels such as passenger vessels, charter vessels and training vessels. Subject areas will include sail theory, sail vessel handling, heavy weather sailing, rules and regulations, voyage planning and emergency procedures. Labs will take advantage of the academy-owned sailing yachts and the schooner *Bowdoin*, including one weekend cruise aboard the *Bowdoin*. Prerequisites: Ns-101, Pe-200, Ps-102 or permission of the instructor. Rec. 2, Lab 2, Cr. 3.

Ns-342: WORKBOAT OPERATIONS - This course provides a background in the operation and management of limited tonnage vessels, particularly those used in support of the offshore energy industry. Topics include vessel design, cargo operations, and vessel management. Lab sessions aboard the *M/V Pentagoet* require students to develop proficiency in all aspects of the vessel's operation. Emphasis is placed on advanced close-quarters maneuvering. Prerequisites: Ns-345. Rec. 2, Lab. 3, Cr. 3.

Ns-343: MODERN SAIL VESSEL TECHNOLOGY - This is a lab course which will introduce the student to modern rigging and sail making skills (including concepts and materials) and their application to professional sailors. Topics to be covered include: assembly and maintenance of double/exotic braid running rigging, leading edge sail construction methods and repair, selection of standing rigging, tuning of multi-spreader rigs, handling characteristics associated with rig tune, winches and furling systems, and spars, and safety while working aloft. Prerequisites: Ns-241 and Pe-200. Lab 6, Cr. 3.

Ns-344: TRADITIONAL VESSEL TECHNOLOGY - Through a mixture of lab and lecture, this course addresses the skills and the historical contexts which are part of maintaining and operating traditionally rigged sailing vessels in the present day. These skills include assembly and maintenance of wire and rope rigging, setting up and tuning this rigging, up-rigging and down-rigging of complex rigs safely, including sending heavy spars aloft, caulking wooden hulls and decks, spar making, block maintenance, working aloft, and general rig safety. Prerequisite: Ns-241. Lab 6, Cr. 3.

Ns-345: SHIP HANDLING - During this course, students will develop the knowledge and practical ability needed to be a boat and ship handler. Topics include propulsion systems, ship maneuvering, anchoring, docking and undocking, emergency situations, ship pilots, ship to ship interaction, channel effects and tug use. Classroom lecture, launch and tug use, as well as the shiphandling

simulator are used to present the material. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 2, Lab. 3, Cr. 3.

Ns-381: TERRESTRIAL NAVIGATION II - A continuation of Terrestrial Navigation I. Students will study the Sailings and other material related to voyage planning. Additional topics include fuel consumption calculations, slip, calculating ETAs and tide and current predictions. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Ns-271 and Ns-272. Rec. 4, Cr. 3.

Ns-382: CELESTIAL NAVIGATION II - An intermediate celestial navigation course intended as an elective, designed to enhance and broaden the student's understanding of celestial topics. Particular emphasis will be placed on the theory of celestial navigation. Extensive use will be made of the Kennaday Planetarium. Prerequisite: Ns-282. Rec. 2, Lab. 2, Cr. 3.

Ns-399: INDEPENDENT STUDY IN MARINE TRANSPORTATION AND NAUTICAL SCIENCE - Prerequisite: Permission of instructor. Cr. 1.

Ns-400: INDEPENDENT STUDY IN MARINE TRANSPORTATION AND NAUTICAL SCIENCE - Prerequisite: Permission of instructor. Cr. 3.

Ns-412: ADVANCED TANKER OPERATIONS - An elective course for deck or engine students planning to sail aboard tankers. Examines the theory, principles, and operation of inert gas and crude oil washing systems found aboard modern tankers. Successful completion of the course will lead to the credit of 2 loads & 2 discharges toward the Tankerman PIC endorsement. Prerequisite: Ns-210, or Et-201 and Eg-234. Cr. 3.

Ns-415: RMS TITANIC - The course will explore the history of the *RMS Titanic*, addressing in particular certain aspects of that history which offer lessons for today's mariner. This should give the student a better in-depth understanding of principles he or she is currently studying in other courses. Particular emphasis will be placed on Hollywood's treatment of the subject, bridge team management, lifeboats, stability, and ship's structure. This course will also address social responsibility issues. Rec. 3, Cr. 3.

Ns-420: SHIP'S BUSINESS - This course addresses the administrative aspect of the master's job aboard ship. Subject areas include applicable U.S. Laws, international codes and conventions, vessel security, shipping articles, logbooks, documents and certificates, Customs and Immigration paperwork, cargo paperwork, charter parties, and dealing with domestic and foreign authorities. Rec. 3, Cr. 3.

Ns-421: HAZARDOUS MATERIALS HANDLING - A study of hazardous materials, chemicals, and substances that are encountered on nearly every worksite: what they are, how to identify them, and how they affect the body. The course progresses into how to work safely with and protect oneself from them, and to react to emergencies. Containment and clean up of spills is also discussed, as is medical surveillance and record keeping. Benzene hazards and petroleum spills and the regulatory requirements relating to them are given special attention. Rec. 3, Cr. 3.

Ns-461: CASUALTY ANALYSIS - Applications of navigation rules with emphasis on the analysis of selected cases and court interpretations. Emphasis on the safety implications of marine casualties as well as casualty management as it relates to applicable federal rules and regulations. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisite: Ns-262. Rec. 3, Cr. 3.

Ns-471: TUG AND BARGE OPERATIONS - Basic theory and practice on towing barges with a tug. Includes types of tugs and their functions, stability and design, towing theory, preparations for tows, interface with regulatory agencies, documentation and safety, and practical towing exercises. Prerequisites: Ns-271, Ns-272, and Ns-345. Rec. 1, Lab. 6, Cr. 3.

Ns-491: ADVANCED NAVIGATION - This course will integrate the components of terrestrial navigation and celestial navigation. Emphasis will be placed on the duties of the second mate. Preparatory instruction for U.S. Coast Guard licensing examinations will additionally take place in this course. Prerequisites: Ns-282 and Ns-381. Rec. 4, Cr. 3.

Ns-497: WATCHKEEPING LIMITED TONNAGE - This course makes extensive use of the simulator to prepare the student to stand a safe navigational watch, performing the required collision avoidance, navigation, communications, and vessel management functions. During the course students are trained and certified in the use of ARPA. Prerequisites: Cr-313, Ns-262, Ns-271, Ns-272, and Ns-292. Rec. 2, Lab. 2, Cr. 3.

Ns-498: WATCHKEEPING - Extensive use of simulator training will occur in this course. Particular emphasis will be placed on radar, ARPA, collision avoidance and bridge team management techniques. Successful completion of this course will result in certification as a Radar Observer as per USCG regulations. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Ns-292, Ns-345, and Cd-203 or Cd-303. Rec. 2, Lab. 2, Cr. 3.

Ns-499: TOPICS IN MARINE TRANSPORTATION - An in-depth review of topics found on the U.S. Coast Guard Third Mate's examination. Mock examinations and quizzes are used extensively. Topics include seamanship, rules and regulations, stability, navigation rules, and ship's business. Rec. 4, Cr. 2.

## NAVAL ARCHITECTURE

Na-152: SHIP STRUCTURE AND STABILITY - Presents the principles of naval architecture and their application to modern vessels. Describes the procedures used in the determination of ship characteristics; damaged and undamaged stability including topics like loose water, flooding and grounding; and typical ship construction and ship building procedures, tests, and ship's trials. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Rec. 3, Cr. 3.

Na-321: OFFSHORE TECHNOLOGY - An introduction to the offshore drilling industry. Topics include: structure of the industry, rig design and construction, sub-sea equipment, mooring and anchor handling, supply and logistics, drilling operations and equipment, and stability and loading. Prerequisite: Ns-301 or Na-152 or permission of instructor. Rec. 3, Cr. 3.

Na-372: NAVAL ARCHITECTURE I - Theory and practice of naval architecture, basic principles and design calculations; terminology, hull form geometry, buoyancy, intact and damaged stability and trim, ship strength and powering. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Prerequisites: Et-230 or Es-235, and Et-201 or Es-245. Rec. 3, Cr. 3.

Na-430: NAVAL ARCHITECTURE II - Ship dynamics. This course continues the development of naval architecture topics including resistance and powering, seakeeping, and maneuvering. In parallel, students will develop a concept design for a small vessel based on a set of mission requirements. Prerequisite: Na-372. Rec. 3, Cr. 3.

## NAVAL SCIENCE

Nv-100, 200, 300, 400: NAVAL LEADERSHIP LABORATORIES - A series of laboratories designed to provide student application of leadership techniques, and to prepare NROTC members for leadership positions in the U.S. Navy and Marine Corps. Lab. 2, Cr. 0 (each term).

Nv-101: NAVAL ORIENTATION - This course introduces the student to the organization of the U.S. Navy. It examines the historical development of the Navy, the development of sea power, and the application of sea power in the geopolitical world of today. The course also introduces the student to the career paths available in aviation, surface warfare, nuclear power, and the Marine Corps. An understanding of the responsibilities of a naval officer, the Navy's mission, general military information, and the applications of these concepts within the Navy are also stressed. Prerequisite: Nv-212 or equivalent with permission of Professor of Naval Science. Rec. 3, Cr. 3.

Nv-202: SEAPOWER AND MARITIME AFFAIRS - In this course, students study the influence of sea power, ships, and trade from colonial days to the present. Emphasis will be placed on American naval history since 1775, the evolution of ships from sail to steam, and the effects of war on seagoing America. Rec. 3, Cr. 3.

Nv-211: NAVAL WEAPONS SYSTEMS - This course provides an in-depth study of the theory and principle of operation of contemporary naval weapons systems. It includes coverage of weapon system types, capabilities and limitations, theory of target acquisition, identification and tracking, sonar, and basics of radar theory. Rec. 3, Cr. 3.

Nv-212: NAVAL SCIENCE FOR THE MERCHANT MARINE RESERVIST I - This course introduces the prospective Merchant Marine Reserve (MMR) officer to the organization of the U.S. Naval Service. It also teaches the varied career opportunities, the long-held customs and traditions of the Naval Service, the capabilities of the U.S. Navy, the duties of a junior officer and Navy policies on relative wellness issues. This course is also designed to begin preparing MMR midshipmen for their first experience onboard a Navy ship by imparting basic information concerning shipboard procedures. Prerequisite: Nv-101 or

equivalent with permission of Professor of Naval Science. Rec. 3, Cr. 3.

Nv-222: NAVAL SCIENCE FOR THE MERCHANT MARINE OFFICER - A continuation of Nv-212, this course provides prospective Merchant Marine Reserve officers with a fundamental understanding of their role in our national security and familiarizes them with the basic principles and procedures for operating a merchant ship as a naval or military auxiliary in a wartime convoy or independent sailing situation. Specific shipboard techniques and the total sea power objectives will be explored to familiarize the student with particular aspects of naval control of shipping, underway operations, and a variety of organizational relationships. Prerequisite: Nv-101 or Nv-212. Rec. 3, Cr. 3.

Nv-301: NAVAL NAVIGATION - This course provides the student with the fundamental understanding and a practical working capability in safe navigation. Included are a comprehensive treatment of coastal piloting, inland and international rules of the road, and an introduction to meteorology as it pertains to heavy weather conditions at sea. Prerequisite; Ns-271 and Ns-272 or equivalent with permission of Professor of Naval Science. Rec. 3, Cr. 3.

Nv-302: NAVAL OPERATIONS AND SEAMANSHIP - This course familiarizes the student with the functions and responsibilities of the junior naval officer in the areas of shipboard operations and administration. Included are a comprehensive study of relative motion, naval communications, ship operations, formation maneuvering, replenishment at sea, and naval command and control. Rec. 3, Cr. 3.

Nv-310: THE EVOLUTION OF WARFARE - This course traces the development of warfare from the dawn of recorded history to the present, focusing on the impact of major military theorists, strategists, tacticians and technological developments. The student acquires a basic sense of strategy, develops an understanding of military alternatives, and learns the impact of historical precedent on military thought and action. Rec. 3, Cr. 3.

Nv-401: LEADERSHIP AND MANAGEMENT - Naval organization and management practices are examined within the context of American social and industrial organization for logistics, service, support functions, and service of major components of the Navy and Marine Corps shipboard organization. Rec. 3, Cr. 3.

Nv-402: LEADERSHIP AND ETHICS - The purpose of this course is to sharpen the student's understanding of some important issues about morality and to develop moral reasoning ability. The course integrates an intellectual exploration of Western moral traditions and ethical philosophy with topics and issues confronting newly commissioned officers as military leaders. The course provides a foundation in major moral traditions, including Utilitarianism, Kantian ethics, Constitutional Law, Natural Law theory, and virtue ethics. In addition, students will discuss the ethics of war through discussions of the Just War Theory (*Jus Ad Bellum*) and the Conduct of War (*Jus Ad Bello*). Readings will be from various fields, including leadership, ethics, philosophy, theology, and law and will be enhanced through case studies, video segments, and current issues in the news. It is recommended that students be in their junior or senior year; however they need not be in the NROTC program. Rec. 3, Cr. 3.

Nv-410: AMPHIBIOUS WARFARE - A historical survey of the development of amphibious doctrine and the conduct of amphibious operations. Emphasis is placed on the evolution of amphibious warfare in the 20<sup>th</sup> century, especially during World War II. Present day potential and limitations on amphibious operations, including the rapid deployment forces concept, are explored. Prerequisite: Nv-310 or instructor permission. Rec. 3, Cr. 3.

Nv-442: NAVAL SCIENCE FOR THE MERCHANT MARINE RESERVIST II - This course is designed to familiarize the prospective Ensign with naval policies, procedures, protocols, and responsibilities as they relate to the Merchant Marine Reserve (MMR) Program. Included are a comprehensive discussion of commissioning responsibilities, planning for and completing the first annual training, and the operation and mission of the MMR Program. Prerequisites: Nv-212 and Nv-222. Rec.1, Cr. 1.

## OCEAN STUDIES

Oc-101: INTRODUCTION TO OCEAN SCIENCE - An introduction to the concepts of physical, geological, chemical, and biological ocean science. Rec. 2, Lab. 2, Cr. 3.

Oc-210: PHYSICAL OCEANOGRAPHY - An introduction to ocean circulation and physical aspects of the ocean's water. Ocean physics exerts important controls on marine life so this course is designed for all students interested in the ocean as a system. Rec. 3, Lab. 3, Cr. 4.

## OCEAN STUDIES

Os-001, Os-002, Os-003, Os-004, Os-005, Os-006: OCEAN STUDIES SEMINAR - A seminar format course covering topics in the ocean sciences and related areas of interest. Designed to develop communication and critical thinking skills, the

course utilizes group discussion and library research to understand and interpret presentations by invited speakers. Topics will be addressed with increasing depth and sophistication as students progress through the series. All Marine Biology and Marine Science majors are required to enroll in this sequence for every semester in residence except the first-year fall and fourth-year spring semesters. Rec. 1, Cr. 0.5.

**Os-101: INTRODUCTION TO MARINE SCIENCE** - An introduction to the physics, chemistry, geology, and biology of the oceans. Laboratory emphasis is on sampling and sensing methods, data analysis, and the interaction of marine environmental phenomena. Rec. 3, Lab. 3, Cr. 4.

**Os-203: DESIGN AND APPLIED STATISTICS IN SCIENCE** - This course instructs the student in the practical application of statistical methods in the sciences. Topics include: introduction to statistical methodology and software, how to select appropriate statistical techniques for data description or hypothesis testing, how to analyze statistical output; how to design laboratory and field experiments, how to design sampling programs, and how to communicate the results of statistical analyses in oral, written, and graphical methods. Rec. 3, Lab. 3, Cr. 4.

**Os-204: PHYSICAL GEOLOGY** - An introduction to geology. The minerals and sedimentary, metamorphic, and igneous rocks that make up the earth are examined. The course includes a survey of the processes that shape the earth, such as: plate tectonics, wind, water, glaciers, volcanism, and mass wasting. Processes internal to the earth such as earthquakes, and effects of these processes, such as faulting and folding are also examined. Rec. 3, Lab. 3, Cr. 4.

**Os-211: MARINE GEOLOGY** - The geology of the deep ocean and continental margins is examined including the formation of these provinces and modification through sedimentation. Presents the role of plate tectonics in shaping the oceans and the role of biology and chemistry in sedimentation. Prerequisite: Os-204 or Os-308. Rec. 3, Cr. 3.

**Os-212: MARINE GEOCHEMISTRY** - An introduction to the chemistry of marine systems and the processes that regulate their chemistry. Topics include: chemistry of the water molecule; fundamentals of solution chemistry; the concepts and measurement of salinity, pH, and alkalinity; and the behavior of selected elements and compounds in sea water and marine sediments including gases, major ions, trace elements, and nutrients, with an emphasis on the physical and biological processes that govern their distribution. Prerequisite: Ch-220. Rec. 3, Cr. 3.

**Os-307: SEDIMENTOLOGY** - A first course in sediments and sedimentary environments. Topics covered will include the physics of sediment transport processes, deposition, and environments of deposition. The laboratory will focus on techniques used to study sediments, and on a study of local sedimentary environments. Prerequisite: Os-204. Rec. 3, Lab 3, Cr. 4.

**Os-308: THE EARTH** - An introduction to geology. The minerals and sedimentary, metamorphic, and igneous rocks that make up the earth are examined. The course includes a survey of the processes that shape the earth, such as: plate tectonics, wind, water, glaciers, volcanism, and mass wasting. Processes internal to the earth such as earthquakes, and effects of these processes, such as faulting and folding are also examined. Rec. 3, Cr. 3.

**Os-309: OCEAN CIRCULATION AND THE PROPERTIES OF SEAWATER** - An introduction to large scale ocean circulation, wind driven flow, tides and waves. This course also covers the seawater properties important to circulation, sound speed and light in the ocean. Rec. 3, Cr. 3.

**Os-321: COASTAL RESOURCE MANAGEMENT** - This course provides students with a comprehensive overview of the coastal environment, its resources and uses. In addition students will learn about federal, state and local coastal planning and management issues. The first part of the course examines the existing management framework. The latter half of the course focuses on specific coastal resource management issues such as coastal pollution, coastal hazards, ocean dumping, offshore oil development, fisheries management and marine and coastal protected areas. Rec. 3, Cr. 3.

**Os-325: TROPICAL MARINE SCIENCE** - An introduction to marine ecosystems in the tropics. Although marine science in the tropical setting will be broadly considered, emphasis will be on the biological and ecological aspects of tropical systems. The course will examine five tropical marine habitats in detail: coral reefs, sea grass beds, mangrove communities, intertidal beaches, and hypersaline habitats. Prerequisites: Bi-210 or Bi-220, Os-101. Rec. 2, Lab. 3, Cr. 3.

**Os-400: PREPARATION FOR RESEARCH IN MARINE SCIENCE** - This course introduces students to the details of conducting research in marine science and marine biology. Both theoretical and practical components of scientific research will be presented. Subsequently, students receive individual instruction in the development of their own research proposal. Prerequisites: Marine Biology majors: Bi-201, Bi-210, Bi-220, Bi-301, Os-101 and Os-203. Marine Science majors: Bi-210 or Bi-220, Oc-210, Os-101, Os-203, Os-204, and Os-212. Rec. 3, Lab 3, Cr. 4.

Os-401: RESEARCH PROJECT - This course requires students to complete a self-designed study that results in an undergraduate thesis. This thesis can be an independent research project or a discrete component of an ongoing research program directed by a faculty member. Research projects may be conducted under the supervision of a researcher not associated with Maine Maritime Academy, but an Ocean Studies faculty member must serve as an internal sponsor and overseer of the project. Prerequisite: Os-400. Rec. 3, Lab 3, Cr. 4.

Os-499: SPECIAL TOPICS IN OCEAN STUDIES - A course allowing students to pursue topics not normally offered in the curriculum, and may be any combination of lecture and laboratory. Departmental approval required. Cr. 1-3 as appropriate.

## PERSONAL DEVELOPMENT

Pd-101 & Pd-102: PERSONAL LEADERSHIP DEVELOPMENT - These courses focus on the fundamentals of personal leadership. Students will study characteristics of effective leadership, and the evolution of leadership behaviors. The course contains an introduction to leadership principles and examines the concept of leadership styles, traits, and types. Students will conduct assessments of their own unique set of leadership traits to identify strengths and weaknesses of their own styles and learn how to effectively employ their leadership abilities. Students will analyze leadership roles in the regiment and in the college's student organizations to expand their leadership "tool bag" and to demonstrate that leadership is both an art and a science. Each course is Rec. 1, Cr. 0.5.

Pd-201 & Pd-202: ORGANIZATIONAL LEADERSHIP/PROFESSIONAL DEVELOPMENT - This course is designed to expose sophomore students to organizational leadership tenants and to assist them in their development of good positive leadership traits. The roles and responsibilities of a leader in the maritime environment are always changing, but one thing remains the same - behind every success in the maritime industry there is a leader who is willing to embrace and conquer challenges. The course will identify the different styles, techniques, and images of a successful leader while incorporating how to develop and fine tune students' leadership skills. Each course is Rec. 1, Cr. 0.5.

## PHYSICAL EDUCATION

Pe-100: BASIC SAILING - Nomenclature, terminology, and sailing techniques for Mercury class boats. Certification in Mercury class boats is possible upon completion of this course. Lab 3, Cr. 0.5.

\* Pe-102: BASIC WATER SKILLS - Covers swimming skills such as stroke mechanics, breath control, diving, as well as drown proofing techniques and hypothermia. This course is ranked as "satisfactory" or "unsatisfactory" and is not computed in the student's QPA. Lab 3, Cr. 0.5.

\* Pe-103: SKIN AND SCUBA DIVING - Basic techniques in use of equipment. Covers safety procedures and physiological aspects of diving. National Association of Underwater Instructors' certification is available, but not mandatory, upon completion of established requirements. Prerequisite: Demonstration of swimming ability. Lab 3, Cr. 1.

Pe-104: TENNIS - Covers basic skills of serving, ground strokes, volley and overhand, as well as strategy, tennis customs and traditions, and rules of the game. Lab 3, Cr. 0.5.

Pe-105: RACQUETBALL - Rules, court strategy, and various shot combinations. Grip, stance, ball control, and other fundamental techniques. Patterns of play for singles and doubles. Lab 3, Cr. 0.5.

Pe-106: HANDBALL - Rules, court strategy, and various shot combinations. Grip, stance, ball control, and other fundamental techniques. Patterns of play for singles and doubles. Lab 3, Cr. 0.5.

Pe-108: PHYSICAL FITNESS - The course enables the student to experience the various components of physical fitness, e.g., endurance, strength, ability, balance, flexibility, and speed. Theories on weight control are discussed. Opportunities to prepare oneself to meet the physical demands of daily life are presented. Lab 3, Cr. 0.5.

Pe-111: VOLLEYBALL - Individual skills and how these skills are used in team play. This includes strategy, rules, and scoring. Lab 3, Cr. 0.5.

\*Pe-113: LIFEGUARD TRAINING - This course is designed to teach lifeguard candidates the skills and knowledge needed to prevent and respond to aquatic emergencies. It offers instruction in accident prevention, water rescue skills, First Aid, and CPR. American Red Cross Lifeguard certification is available. Prerequisite: Demonstration of swimming ability. Lab 3, Cr. 1.

\*Pe-114: OCEAN SURVIVAL - A cold water safety and survival course to familiarize students with the planning and steps

necessary to work, recreate, and supervise safety on or around cold water. This course supports the marine license program requirements to meet the Standards for Training, Certification and Watchkeeping (STCW). The course may have embedded assessment requirements that must be completed in addition to the class requirements. Lab 3, Cr. 0.5.

Pe-120: CONTEMPORARY HEALTH ISSUES: SUBSTANCE USE AND ABUSE - The main course objective is to impart information about substance use and abuse that is correct and current; includes independent study. Rec. 3, Cr. 0.5.

Pe-130: SPECIAL TOPICS IN PHYSICAL EDUCATION - This course allows students to pursue various topics in physical education that might not be offered regularly in the PE curriculum. Prerequisite: approval of Athletic Department Chair. Lab 3, Cr. 0.5.

Pe-200: INTERMEDIATE SAILING - This half-semester course will follow Pe-100, Basic Sailing, and labs will be taught in Mercurys and sloops of up to 30 feet. Topics will include use of the spinnaker, precise maneuvering under sail and power, including mooring, anchoring and docking, and heavy weather sailing in sloops. A grade of A or B will earn the student a MMA Intermediate Sailing Certification for sailing outside of classes. Prerequisite: a grade of A or B in Pe-100, or certification in Mercury sloops, or permission of the instructor. Lab 3, Cr. 0.5.

Pe-401: ADVANCED SAIL VESSEL HANDLING - A follow-on course to Intermediate Sailing and Auxiliary Sail Vessel Operations. This course will give the student substantial vessel handling under sail on vessels 25-45'. Students will be challenged with advanced sailing maneuvers with and without the instructor on board. Participants will take part in activities focused around various career options available to professional sailors. Course work is comprised of weekly labs and sailing activities scheduled by the student outside of lab time. Prerequisite: Pe-200, Ns-341, or Maine Maritime Academy certification as skipper of 20-30 foot sloops. Lab 3, Cr. 1.

\*Each first-year student must participate in one of the following: Pe-102, 103, 113, or 114.

## POLITICAL SCIENCE

Po-200: AMERICAN GOVERNMENT - A survey of the characteristics and functions of the American political system with emphasis on the origins and activities of the institutions of the American national government. Rec. 3, Cr. 3.

Po-230: CONTEMPORARY WORLD POLITICS I - This course is an introductory survey of the field of international relations with an emphasis on the interaction of global political, social, and economic factors. Rec. 3, Cr. 3.

Po-330: CONTEMPORARY WORLD POLITICS II - This upper level course allows students to pursue more in-depth study of particular areas of foreign relations. Topics might include modern development of Latin America, the Middle East, South Asia, the Pacific Rim or Western Europe. Prerequisite: Po-230 or permission of the instructor. Rec. 3, Cr. 3.

## PHYSICS

Ps-102: TECHNICAL PHYSICS I - An introductory college physics course without calculus. Emphasis is on Newtonian mechanics with problem solving using algebra, geometry and trigonometry. Lab work is included. Prerequisite: Ms-101 or Ms-102 with a grade of a C or better (Ms-103 concurrently). Rec. 3, Lab. 2, Cr. 4.

Ps-162: PHYSICS I - A calculus based physics course treating mechanics, energy, rotation, and simple harmonic motion. Prerequisite: Ms-120 or Ms-150 taken concurrently. Rec. 3, Lab. 2, Cr. 4.

Ps-201: TECHNICAL PHYSICS II - A continuation of Ps-102 with emphasis on electricity and magnetism, and other related topics as time permits. Prerequisite: Ps-102. Rec. 3, Lab. 2, Cr. 4.

Ps-211: COSMOS - This introductory course in cosmology is a study of the latest data and theories about the evolution of the physical universe. Although largely descriptive, understanding of Newtonian mechanics, basic algebra, and geometry is required. Each student must have easy access to the Internet, either through the MMA network or via a home connection. Prerequisite: Ps-102 or Ps-162 with a grade of C- or above. Rec. 3, Cr. 3.

Ps-220: SPECIAL TOPICS IN PHYSICS - A course allowing students to pursue topics not normally offered in the curriculum. Proposals may be student initiated, in consultation with an instructor, and may be any combination of lecture and laboratory. Departmental approval required. Prerequisite: permission of instructor. Cr. 1-3 as appropriate.

Ps-261: PHYSICS II - A continuation of Ps-162 with emphasis on electricity, magnetism, electromagnetic induction, and

radiation. Prerequisite: Ps-162 or permission of the instructor. It is recommended that Ms-160 be taken concurrently if not already taken. Rec. 3, Lab. 2, Cr. 4.

Ps-299: INDEPENDENT STUDY IN PHYSICS - A course allowing students to pursue advanced topics not normally offered in the curriculum. Proposals are student initiated in consultation with the instructor. May be repeated for credit. Prerequisite: permission of instructor. Cr. 1-3 as appropriate.

Ps-300: MODERN PHYSICS - Modern physics introduces the student to the special theory of relativity, quantum mechanics, nuclear and elementary particle physics. It is a survey course with applications. Problem solving requires basic understanding of calculus and differential equations. Prerequisites: Ps-261 or Ps-201 and Ms-160. Rec. 3, Cr. 3.

## PSYCHOLOGY

Py-200: INTRODUCTION TO PSYCHOLOGY - This course provides an introduction to psychology – theories, research and practice. Emphasis will be on human behaviors, the brain, perception, principles of learning and therapies. Rec. 3, Cr. 3.

Py-210: HUMAN RELATIONS AND GROUP DYNAMICS - This course is designed to help students understand, critique, analyze and integrate the major theories, research and application of dyadic and small group processes. It will emphasize group effectiveness for completion of tasks and communication. Diversity, including gender, ethnicity and culture, will be examined. Status and power will be examined from both worker and supervisor perspectives. Students will participate in structured group activities in an environment that facilitates candid and authentic communication. Prerequisite: Py-200. Rec. 3, Cr. 3.

Py-220: PSYCHOLOGY OF GENDER - The course explores what it means to be male and female. It 'unpacks' gender stereotypes, society's gender expectations and looks at diversity in other cultures as well. Projects encourage students to research figures from our past who have been traditionally overlooked in history textbooks. Prerequisite: Py-200. Rec. 3, Cr. 3.

Py-240: DEVELOPMENTAL PSYCHOLOGY - The course explores human growth and development from conception to death. In life span development, every state is examined by looking at physical growth, socioemotional growth and cognitive growth. Projects in the course are designed to give students hands on experience conducting small research studies to demonstrate the theories. Prerequisite: Py-200. Rec. 3, Cr. 3.

## SMALL VESSEL MANAGEMENT

Ym-222: SMALL BUSINESS MANAGEMENT - An introduction to small business management from an entrepreneurial perspective. The challenges associated with starting a small business will be explored, with emphasis on creating and maintaining a sustainable competitive advantage. Social responsibilities, accounting and marketing are some of the topics covered. A major part of the course work is focused on the development of an individual business plan. Rec. 3, Cr. 3.

## SMALL VESSEL OPERATIONS

Yo-103: BOATYARD OPERATIONS - An introductory course designed to familiarize the student with the fundamentals of safely handling a small vessel around dockside facilities, and to haul, launch and service these vessels. Basic boat handling skills such as docking, anchoring and towing will be practiced. Emphasis is placed on boatyard, shop and personal safety issues. Operation of the travel lift and fork lift are also covered. The lab portion of this course is integrated into the operation of the MMA waterfront facility. Rec. 2, Lab. 2, Cr. 2.

Yo-222: YACHT MANAGEMENT - This course is designed to address the major challenges facing those who manage and typically captain both privately owned and chartered yachts. Topics covered include an overview of the yacht industry and the captain's responsibilities for fiduciary obligations, crew management, trip planning, and offshore passage making. Shipyard/haul out planning and management are also addressed. A major project for the course is the development of an individual trip plan. Prerequisite: Consent of instructor. Rec. 3, Cr. 3.

Yo-298: TOPICS IN SMALL VESSEL OPERATIONS - A capstone course intended to further prepare 200 ton license candidates for positions of responsibility aboard a limited tonnage vessel. This course will expand the student's knowledge of vessel design, construction, stability, emergency maneuvers and operations. Attention is also given to crew management, regulatory issues, and the variety of decisions that a professional mariner may expect to face. Prerequisite: Ns-241. Rec. 2, Cr. 2.

Yo-299: 200 TON LICENSE PREPARATION - Course to assist senior license candidates in preparing to write the appropriate USCG license examination. Sample tests will be used, test-taking techniques studied and study guides reviewed. The use of CFRs and other references will be covered. Rec. 2, Cr. 1.

## SMALL VESSEL TECHNOLOGY

Yt-102: SMALL CRAFT TECHNOLOGY - Introduction to the fundamentals of the engine and drive-train typically found aboard small craft. Emphasis is on the high speed marine diesel engine, the theory of its operation and the understanding of its associated components. Fuel, air, lubrication, and cooling systems are covered. The lab includes the disassembly, inspection, re-assembly and running of a small diesel engine. Rec. 2, Lab. 3, Cr. 3.

Yt-105: SMALL CRAFT CONSTRUCTION - An introduction to the fundamentals of building small craft. While the major focus will be on wooden boat plans and construction, the course will also cover steel, aluminum and fiberglass construction methods. Vessel construction terminology, the process of lofting, and scantling requirements are discussed. The lab is focused on the building of a 14 foot flat bottomed wooden skiff. Rec. 2, Lab. 2, Cr. 3.

Yt-210: MARINE SYSTEMS - Electrical and mechanical system fundamentals, associated with yachts and small commercial vessels, are examined. These include: DC electrical theory and installation standards, storage batteries, multi-meter use, AC electricity, pumping systems, refrigeration, reverse-osmosis water makers and hydraulics. ABYC standards and CFR requirements are covered. The lab explores DC circuits, wiring standards, systems operation, installation and maintenance. Prerequisite: Yt-102. Rec. 2, Lab. 2, Cr. 3.

## BATH IRON WORKS COURSES

The following courses are taught at the Bath Iron Works Shipyard in Bath, Maine, and are available only to BIW apprentices.

## CHEMISTRY

CH101: CHEMISTRY - This course will emphasize the basic laws and theories of chemistry and their derivation from experimental evidence. It presents the qualitative and quantitative aspects of matter's composition and changes and their unifying principles. It includes physical and chemical properties, periodicity of elements, stoichiometry, current atomic and bonding theories, laws and theories of physical states and changes of state, solution chemistry, and thermochemistry. Rec. 3, Cr. 3.

CH102: CHEMISTRY LAB - Laboratory experiments to emphasize the empirical basis for the principles discussed in lecture and the proper gathering and interpretation of experimental data. Corequisite: CH101. Rec. 3, Lab 3, Cr. 1.

## COMPUTER SCIENCE

CS201: INTRODUCTION TO COMPUTING - This course is designed to introduce the student to personal computer use in a modern business environment. Emphasis is on skill development in a variety of applications, including word processing, spreadsheets, and relational databases, working in a local area network, and corporate systems. Rec. 4, Cr. 2.

## ECONOMICS

EC102: PRINCIPLES OF ECONOMICS - Topics include supply and demand; business organizations; money and credit; the banking system; government finance; business and public investment; emergency economics; depression and inflation; the federal government and economic development abroad. Rec. 3, Cr. 3.

## ENGINEERING

EG102: INTRODUCTION TO MARINE ENGINEERING - A study of marine systems with emphasis on new construction. The course is designed to provide the student with an overview of marine systems and the techniques used to install, test and align these systems. A review of ship construction manufacturing technique is also covered. Rec. 3, Cr. 2.

EG103: INTRODUCTION TO NONDESTRUCTIVE EXAMINATION METHODS - This course will contain introductory information on the basis of nondestructive testing, including all aspects of visual inspection. This will include discussion of typical sources of material manufacturing discontinuities in raw stock, forgings, castings, tubing/pipe, as well as discontinuities due to grinding, heat treating, welding, and fatigue. This course will also provide training in the visual inspection process, including the basis of visual perception, equipment, and acceptance/rejection criteria. Rec. 2, Cr. 1.

EG105: LIQUID PENETRANT AND MAGNETIC PARTICLE EXAMINATION METHODS - This course is designed to provide the necessary training required to perform liquid penetrant (PT) and magnetic particle (MT) testing on various base materials and weld configurations, and to then evaluate the results. Training in each method will be provided such that base material or weld discontinuities can be detected, and then evaluated to determine if they are acceptable or unacceptable. Rec. 2,

Cr. 1.

**EG120: MECHANICAL DRAWING I** - An introduction to the basics of mechanical drawing, including equipment and general drawing techniques; geometric construction; multiview (orthographic) drawings; basic isometrics; section views; descriptive geometry; and auxiliary views. Rec. 3, Cr. 3.

**EG201: ULTRASONIC TEST METHODS** - This course is designed to provide the necessary training required to perform ultrasonic testing (UT) on various base metals and weld configurations, and then to evaluate those results. Training will be provided on ultrasonic theory and instrument operation, with application to thickness gauging and flaw detection. Further training will be provided on interpreting data to determine discontinuity shape, identity and location, and then evaluating these results to determine acceptability. Rec. 2, Cr. 2.

**EG202: CONFINED SPACE SAFETY** - This course will provide instruction in the various methods, processes, and concepts required to recognize, evaluate, and control confined space hazards. Students will understand the duties associated with the testing of confined spaces. Students will also recognize key uses and limitations of testing instrumentation. Training will include certification as a designated Shipyard Competent Person (OSHA). Rec. 4, Cr. 1.

**EG203: RADIOGRAPHIC TEST METHODS** - This course is designed to provide the necessary training required to perform radiographic (RT) testing on various base materials and weld configurations, and to then evaluate the results. Radiological safety measures will be stressed (including state certification). Instruction will include the necessary inspection techniques, film handling, etc. to ensure adequate film contrast and clarity. Further instruction will be provided on interpreting, identifying, and evaluating radiographic film discontinuities. Rec. 2, Cr. 2.

**EG215: BLUEPRINT READING METHODS** - A study of the sketches and blueprints used by the structural trades. Rec. 3, Cr. 1.

**EG216: SHEET METAL METHODS** - A study of the blueprints and procedures used in the sheet metal trade. Rec. 3, Cr. 1.

**EG217: PIPEFITTING METHODS** - A study of the blueprints and procedures used in the pipefitting trade. Rec. 3, Cr. 1.

**EG218: ELECTRICAL METHODS** - A study of the blueprints and procedures used in the electrical trade. Rec. 3, Cr. 1.

**EG219: OUTSIDE MACHINIST METHODS** - A study of the blueprints and procedures used in the outside machinist trade. Rec. 3, Cr. 1.

**EG240: WELDING TECHNOLOGY** - A course designed to provide insight into the technical aspects of standard welding techniques and practices. It includes a review of the welding processes (SMAW, GTAW, GMAW, SAW) weld procedure essential elements, weld distortion control, VT and NDT requirements, and causes of weld defects. Rec. 3, Cr. 1.

**EG241: WELDING SYMBOLS** - Introduction to recognizing, reading, interpreting, and drawing welding symbols. Rec. 2, Cr. 1.

**EG250: MECHANICAL DRAWING II** - A continuation of Mechanical Drawing I, including parallel and radial line developments as well as triangulation in the drawing of ventilation and piping systems. Practical ventilation, piping, and shipboard application problems are also studied. Prerequisite: EG120. Rec. 3, Cr. 3.

**EG255 and EG355: MACHINE SHOP THEORY I and II** - A study of the tools, materials, machinery and technology used in the machine shop. Rec. 3 and 3, Cr. 3 and 2.

**EG280: BASIC ELECTRICITY** - Introduction to the nature of electricity: resistance, current, voltage, Ohm's law, network theorems, and AC. Rec. 3, Cr. 2.

**EG281: ELECTRICITY II** - A continuation of Basic Electricity, introduces inductive and capacitive circuits, meters and transformers. Prerequisite: EG280. Rec. 3, Cr. 3.

**EG282: ELECTRICITY III** - Topics include construction and troubleshooting of AC and DC generators and motors. Prerequisite: EG281. Rec. 3, Cr. 1.

**EG283: ELECTRICITY IV** - Topics include development and layout of motor control circuits and uses individual and team labs involving hot and de-energized motor control circuits. Prerequisite: EG282. Rec. 3, Cr. 3.

## ENGINEERING TECHNOLOGY

**ET200: BASIC ELECTRONICS** - Introduction to the nature of electronics, semi-conductor fundamentals, diodes, zener diodes, and their use in power supply and regulator circuits. Rec. 3, Cr. 2.

**ET206 and ET306: MECHANICS I and II** - The study of forces applied to structures. Introduces vector mechanics, static equilibrium, two and three dimensional force systems, distributed forces and friction, linear and angular kinematics, linear and angular kinetics, energy methods, impulse, momentum, kinetics of three-dimensional motions, and vibrations. Structures studied include plane and three-dimensional trusses, frames, beams, and cables. Rec. 3 and 3, Cr. 3 and 2.

**ET207: ELECTRONICS II** - A continuation of Basic Electronics, introduces bi-polar transistor operation and characteristics, field effect transistors, thyristors, and optoelectric devices. Prerequisite: ET200. Rec. 3, Cr. 2.

**ET208: ELECTRONICS III** - Topics include digital concepts: number systems, semiconductor devices for digital circuits, integrated, digital integrated, and digital logical circuits. Boolean algebra and arithmetic circuits will be covered as time permits. Prerequisite: ET207. Rec. 3, Cr. 3.

**ET209: ELECTRONICS IV** - Topics in counter circuits, shift registers, timers, analog interfacing, memories, microprocessors, fundamentals, and programmable logic controllers will be covered as time permits. Prerequisite: ET208. Rec. 3, Cr. 3.

**ET230: STRENGTH OF MATERIALS** - A study of stresses and strains in structural members including tension, compression, shear, torsion, bending, and combined stresses. Stresses and strains in beams, columns, and indeterminate structure are also examined. Rec. 3, Cr. 3.

**ET235: MATERIAL PROPERTIES AND TESTING I** - A foundation course designed to acquaint the student with the properties and testing procedures of today's common industrial materials used in ship building. Materials science, application considerations, and analysis of properties of metals, plastics, ceramics and composites will be covered through classroom and laboratory activity. Destructive and non-destructive testing procedures will be performed to identify and determine mechanical, physical and other properties for specific industrial and ship building applications. Rec. 3, Cr. 3.

**ET236: MATERIAL PROPERTIES AND TESTING II** - This class is an in-depth study of the principles explored in ET235 for students in the Structural Fitter and Welder disciplines. Individual students will demonstrate the practical application of these principles by building separate components of a physical class project. Decisions regarding selection of materials, details of product design and selection of manufacturing processes will be made by each student. Completed components must meet functional requirements, and will be subjected to physical testing. Prerequisite: ET235. Rec. 3, Cr. 1.

**ET280 and ET380: FUNDAMENTALS OF MARINE DESIGN I and II** - An intensive introduction to marine design. Emphasis is placed on the application of the design processes used in the shipbuilding industry. Interactive group and individual instruction focuses on the importance of sound working relationships among the design disciplines. A Design Control Composite project leads to development of individual design-specific production drawings. The course is divided into three (3) modules. Module one (1) consists of several presentations of cross-discipline topics spanning about six (6) weeks. Module two (2) is comprised of approximately 23 weeks of discipline specific topics. Module three (3) is an application exercise where the students do actual work on a class project. Rec. 2 and 2, Cr. 2 and 2.

**ET282: DESIGN PRACTICES** - The goal of this course is to give students the skills required to make sound decisions when developing any design. Emphasis will be on concept development while considering manufacturing processes, cost, material selection, standardization, design evaluation and prototype development. Students will also develop skills and become familiar with types of tradeoffs required in a fast track design environment. Prerequisites: MS203 or MS204, and EG210. Rec. 2, Cr. 2.

## HUMANITIES AND COMMUNICATION

**HC110: BUSINESS COMMUNICATIONS** - Students apply basic writing skills to produce various types of business communications, including formal and informal reports, proposals, procedures, memos and letters. Students will also produce resumes and letters of application. Rec. 3, Cr. 3.

**HC113: ORAL COMMUNICATION SKILLS** - Deals with the basics of business and professional communications, personal skills, working in groups and making effective presentations. Students will study methods of problem solving, managing conflict and conducting effective meetings through lecture and extemporaneous exercises. Students will also develop and make presentations of various lengths to selected audiences. Rec. 3, Cr. 3.

## MANAGEMENT

**MA200: LABOR HISTORY** - The history of the organized labor movement in the United States and Canada. Includes the colonial period through the twentieth century. An introduction to the precepts of labor law and collective bargaining. Particular attention will be paid to the history of labor in Maine, the shipbuilding industry, and Bath Iron Works. Rec. 3, Cr. 2.

**MA230: ORGANIZATIONAL BEHAVIOR** - A second-year college-level course which is directly concerned with the understanding, prediction, and control of human behavior in organizations. The course presents the behavioral approach to management. Rec. 3, Cr. 3.

## MATHEMATICS

**MS105: MATHEMATICS I** - This course is designed to provide a foundation of mathematic skills necessary for the applied technical courses which follow. Areas of study include a review of basic algebra; solving equations and word problems; geometry; trig functions, right triangles and vectors; and factors and factoring. Rec. 3, Cr. 3.

**MS205: MATHEMATICS II** - A continuation of Mathematics I, including the study of fractions and fractional equations; systems of linear equations; exponents and radicals; quadratic equations; oblique triangles; and radian measure. Prerequisite: MS105. Rec. 3, Cr. 3.

## NAVAL ARCHITECTURE

**NA150: MOLD LOFTING** - Topics include the history and development of molded lines; the use of molded lines and offsets in the design and manufacturing of a ship's structure; designer's responsibilities; and the organization of the Bath Iron Works design department. Rec. 3, Cr. 1.

**NA151: SHIP BUILDING PROCESS** - A study of the principles of naval architecture and their application to modern vessels and the building methods and processes used at BIW. Topics include production design, pre-fabrication, structural assembly, outfitting, erection, and launching. Rec. 3, Cr. 3.

## PHYSICS

**PS103 and PS203: PHYSICS I and II** - An introductory college physics course sequence without calculus. Emphasis on Newtonian mechanics of rigid bodies, fluids, heat and introductory thermodynamics, electricity and magnetism. Other related topics as time permits. Rec. 3 and 3, Cr. 3 and 3.

## THE LANDING SCHOOL COURSES

The following courses are taught at The Landing School in Kennebunkport, Maine, and are available only to students enrolled in the Small Craft Design and Small Vessel Systems majors.

## CAD

**Cd-101: CAD 1** – Students are introduced to two CAD programs: AutoCAD for basic 2-D drawing and Fast Ship for basic 3-D hull surface definition. The basic functionality of the programs is demonstrated. Emphasis is on those features that demonstrate the relationship between computer-aided-design and the sketching and manual drafting skills from the Construction 1 class. Prerequisites: Et-101, Ct-101, De-101. Rec. 4, Lab 2, Cr. 2.

**Cd-201: CAD 2** – Advanced features of AutoCAD and Fast Ship are explored. Emphasis in AutoCAD is on those features that add character to the drawing; and in Fast Ship on those features needed to extract data from the model to assess static and dynamic stability. Prerequisite: Cd-101. Rec. 1, Lab 1, Cr. 1.

**Cd-301: CAD 3** – Students are introduced to the 3-D modeling program RHINO. Basic functionality of the program is demonstrated with emphasis of features of the program such as screen and tool layout, drawing tools and manipulation tools. Prerequisite: Cd-201. Rec. 1.5, Lab 1, Cr. 1.

## CONSTRUCTION

**Ct-101: CONSTRUCTION 1** – Introduction to the basic mechanical drafting and yacht design drawing tools. Proper techniques

for using these tools to draw, dimension, and letter basic design drawings are taught. Sketching is used as a precursor to the development of formal drawings. Prescriptive scantling rules are used to determine how to develop a construction plan for a wooden boat. Prerequisite: Et-101. Rec. 4, Lab 1, Cr. 2.5.

**Ct-102: CONSTRUCTION 2** – Provides the students with an understanding of the systems found on small boats. Students are exposed to typical methods for matching system requirements to a project boat's mission and operation. The methods and procedures for converting the system requirements into sketches, equipment sizing calculations, schematics and drawings are demonstrated. Prerequisite: Ct-101. Rec. 3, Lab 4, Cr. 2.

**Ct-201: CONSTRUCTION 3** – Students are assigned an aluminum motor boat project for the course. The boat is to be designed to ISO standards. The logic, criteria and methodology forming the basis of the standards are reviewed. Students are introduced to basic welding technology and weld joint design. Prerequisites: De-102 and Ct-102. Rec. 4, Lab 3, Cr. 3

**Ct-202: CONSTRUCTION 4** – Students are assigned a composite boat project for the course. The boat structure is to meet the requirements of ISO Category A. The logic, criteria and methodology forming the basis of the standards are reviewed. The students are introduced to the Hullscant© computer program for sizing plate panels and panel stiffeners and other structural elements. Students will work independently approximately 60 hours on their projects. Prerequisites: De-201 and Ct-201. Rec. 2, Lab 1.5, Cr. 3.

## DESIGN

**De-101: DESIGN 1** – An introduction to the basic elements of naval architecture and small craft technical design which begins the development of appropriate drawing and design skills. Particular attention is given to hydrostatics and stability issues to ensure students have a thorough understanding of floatation and safe and satisfactory design and the associated calculations. Prerequisites: Cs-150, Ms-101, and Et-101. Rec. 5, Lab 2.5, Cr. 3.5.

**De-102: DESIGN 2** – Builds on the basic elements covered in DESIGN 1 by moving on to consider the design of sailing craft. Hull form, keels and rudders and the design of deck layouts and sail plans are considered as well as methods of assessing power to carry sail. Prerequisite: De-101. Rec. 5, Lab 2, Cr. 2.

**De-201: DESIGN 3** – Builds on elements covered in DESIGN 1 and 2 and extends them to the study of motor driven craft. Dynamic considerations and their effect of hull form and propulsion system design, small craft performance, control and safety with particular interest on planing boats. Prerequisite: De-102. Rec. 5, Lab 3, Cr. 3.

**De-202: DESIGN 4** – Builds on elements covered in DESIGN 1, 2 and 3 and extends their application to a fully developed outline design. Attention is given to aesthetic and practical aspects of design. This student centered course is based on a large-scale directed and independent project involving the complete outline design of a sea-going vessel between twenty-seven and forty feet on the waterline. Prerequisite: De-201. Rec. 1, Lab 2, Cr. 2.

## STRENGTH

**St-101: STRENGTH 1** – Review of basic physics and mathematics. Basic engineering approach to evaluating loads on structure is presented. The procedures for evaluating end reactions and internal loading on typical structures found on boats are dealt with extensively. Prerequisites: Ms-101 and Ps-102. Rec. 5, Cr. 2.

**St-202: STRENGTH 2** – Basic theory and standard analytical process is introduced for several topics including: shafts and couplings for torsion; beams that are strength limited; beams that are deflection limited; spars and stanchions in compression; and metal and composite plating. Prerequisite: St-101. Rec. 4, Lab 3, Cr. 2.

## TOPICS IN DESIGN

**Td-101: TOPICS IN DESIGN 1** – Introduction to the issues to be considered in the early stages of the design process. This will develop students' skills in the fundamental techniques of sketching and task identification that clarify and define a design project. Several guest lecturers will present. Rec. 1, Lab 1, Cr. 0.5.

**Td-102: TOPICS IN DESIGN 2** – Builds on issues from Topics in Design 1 and considers technical areas relating to the design of planing craft and the importance of aesthetics in the design process. Several guest lecturers will present. Prerequisite: Td-101. Rec. 1, Lab 1, Cr. 0.5.

**Td-201: TOPICS IN DESIGN 3** – Introduces the student to the problem of sailboat balance and describes techniques that can

be used to assess the quality of design with regard to balance. Prerequisite: Td-102. Rec. 1, Lab 1, Cr. 0.5.

Td-202: TOPICS IN DESIGN 4 – Introduces students to the issues to be considered before setting up an independent design office and offers guidance for success. This course also provides support of the students' work of their Design 4 project.

Prerequisite: Td-201. Rec. 0.5, Lab 3, Cr. 0.5.

UPDATED 6/16/2009

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dial (207) 326-2 and then the 3-digit extension,  
except when the 3-digit extensions start with 7, then use either 0 or 4.

Calls on-campus:

dial the 3-digit extension only.

## PHONE DIRECTORY

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911 Service is available in the Castine area – all campus phones require 9 to dial off-campus, therefore to dial 911 direct from campus, dial 9-911.

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Emergency Service - Castine Community Health Services 326-4348  
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Emergency Service - MMA Health Services 295  
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Administration/Vice President for Finance 230  
Administrative Computing 247  
Administrative Officer 230  
Administrative Operations/Human Resources 241  
Admissions Office 206/207  
Advancement Office 177/232  
Alumni Office 337  
Arts and Science - Chair 345  
Assistant Commandant 293  
Assistant Registrar 441/426  
Associate Academic Dean 489  
Athletics 450/451  
Athletic Equipment Issue Room 458  
Athletic Training Room 459  
Audio Visual Support 136/240  
Auditorium/Projection Room/BIW 216  
Auditorium/Stage/BIW 246

Barber Shop - Curtis Hall 284  
Basketball Coach - Men's 452  
Basketball Coach - Women's 372  
Bergin Simulator - BIW Building 123  
Bilge Lounge 478  
BIW CAD Lab 705  
Bookstore 430/326-9333  
Bridge Simulator - BIW Building 336

CAD Lab - Bath Iron Works Center 705  
Career Services 276  
Castine Adams School 326-8608

Castine Community Health Center 326-4348  
Castine Fire Department 911  
Castine Post Office 326-8551  
Castine Town Office 326-4502  
Chemistry Lab - Dismukes 244  
Commandant of Midshipmen 250/251  
Commander - NROTC 354/352  
Communications Desk 0/479  
Company Officer A & D 153  
Company Officer B & C 287  
Conference Center 283  
Continuing Education 211  
Cooperative Education 279/333  
Corning School of Ocean Studies - Chair 395  
Counseling Services 419/295  
Curtis Hall - Maintenance Storeroom 446/136  
Curtis Hall - Quarterdeck 290  
Curtis Hall - RA's Office 149  
Custodial Services 418

Dean of Student Services 138  
Development Office 223/470  
Diesel Lab 392  
Dining Services 462  
Dining Services Director 460/461  
Dining Services - Secretary 461  
Dining Services - Waypoint 468  
Director of Graduate Studies 454/212

Electrical Power Lab 394  
Emergency Service - Castine Community Health Services 326-4348  
Emergency Services - Counseling 419/295  
Emergency Service - Fire 911  
Emergency Service - MMA Health Services 295  
Emergency Service - Security 479  
Engineering - Chair 369

Facilities - Vehicle Issue 447  
Facilities - Work Requests 136  
Faculty Secretary 225  
Fax Machine - Admissions 326-2515  
Fax Machine - Alumni 326-2135  
Fax Machine - Athletics 326-2513  
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Fax Machine - Career Services 326-2268  
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Fax Machine - Dining Service 326-2472  
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Fax Machine - Finance 326-2109  
Fax Machine - Graduate Studies 326-2411  
Fax Machine - Health Services 326-2129  
Fax Machine - Human Resources 326-2134  
Fax Machine - International Business 326-2411  
Fax Machine - Library 326-2261  
Fax Machine - NROTC 326-2351  
Fax Machine - President 326-2110  
Fax Machine - Purchasing/Facilities 326-2439  
Fax Machine - Registrar 326-2510  
Fax Machine - Ship 326-2131

Fax Machine - STCW 326-2384  
Fax Machine - Waterfront 326-2377  
Finance Office - Accounts Payable 237  
Finance Office - Assistant Director 242  
Finance Office - Cashier 236  
Finance Officer - Director/Student Accounts/Billing 243  
Financial Aid Office 339/205  
Football Interns 455  
Football Offices 259/453/455

Graduate Studies - Chair 454/212

Health Services 295  
Human Resources - Director 241  
Human Resources - Assistant 231

Information Technology – Director 715  
Information Technology – Help Desk 240  
Information Technology – Network Manager 111  
Information Technology – Technical Support 716/514  
International Business and Logistics - Chair 454/212

Lacrosse Office 259  
Leavitt Hall – Front Desk 217  
Librarian 260  
Library - Platz Hall 263  
Loeb Sullivan School of International Business & Logistics 454/212

Machine Shop - Rodgers Hall 390  
Mailroom - Student Union 200/473  
Maintenance 136  
Marine Science Lab 391  
Marine Transportation - Chair 126

NROTC 352

Payroll Offices 231/334  
Payson Hall Lunch Room 487  
Physical Education Director 451  
Physical Education Office 450/451  
Planetarium 126  
Port Captain 250/251  
President's Office 220/221  
Provost/Academic Dean 485/371  
Public Affairs 256  
Purchasing Office 447/440  
Purchasing - Director 445

Quarterdeck - Curtis Hall 290

RA Shack 149  
Regimental Commander 299  
Registrar 426/441  
Residential Life 280/204

Sailing Master 504/410/364  
Security and Safety 479  
Ship - Administrative Office 132  
Ship - Captain 425  
Ship - Chief Engineer 422

Ship - Chief Mate 423  
Ship - Quarterdeck 420  
Ship - Supply Officer 421  
Soccer Coach - Men's & Women's 112  
Softball Coach 484  
Sports Information 372  
STCW Office 384  
Student Activities 280/119  
Student Mailroom 473  
Student Payroll 334  
Student Services 280/138  
Substance Abuse Coordinator 419  
Swimming Pool 457  
Switchboard 479/0

Thompson School of Marine Transportation - Chair 126  
Training Room 459

Vehicle Issue 440/447

Waterfront Office 364/400  
Waypoint Snackbar 468  
Wedge 299  
Welding Laboratory 406  
Work Study - Student Financial Aid 339/205

Yearbook Office 280

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TEMPLE BLACKWOOD, Part-time Adjunct Faculty in Arts & Sciences; B.S., University of Hartford School of Education; M.A., Washington College; Appointed 2009.

JOCELINE BOUCHER, Associate Academic Dean; Professor of Marine Chemistry; A.B., University of Chicago; M.S., University Southern California; Ph.D., University of Rhode Island; Appointed 1991.

LOUISE BOURNE, Part-time Adjunct Faculty in Art; B.F.A., Portland School of Art; M.F.A., University of Michigan; Appointed 2000.

MARGARET E. BRANDON, Associate Professor of Marine Transportation; B.S., M.M.A., University of Rhode Island; Master, Steam, Motor, or Auxiliary Sail Vessels, 1600 tons; Appointed 2006.

WILLIAM J. BRENNAN, Adjunct Professor in Marine Science, B.S., University of Maine; M.A., University of Rhode Island; Ph.D., University of Maine; Appointed 2002.

JOHN W. BRIDGE, Associate Professor of Engineering; B.S., United States Air Force Academy; M.S., University of Dayton; Ph.D., University of Maine; Registered Professional Engineer; Appointed 2006.

THOMAS A. BUTERBAUGH, Professor of Naval Science; CAPT, USN; B.S., United States Naval Academy; M.S., Naval Postgraduate School; Appointed 2009.

JAMIE V. CARTER, Part-time Adjunct Faculty in Bath Iron Works Apprenticeship Program Department of Engineering; A.S., Maine Maritime Academy, BIW/MMA Apprenticeship Program; Appointed 2006.

[G. ANDERSON CHASE](#), Chair, William F. Thompson School of Marine Transportation; Professor of Marine Transportation; B.S., Maine Maritime Academy; Master, Steam or Motor Vessels, Unlimited; Master, Auxiliary Sail Vessels, 1600 tons; Appointed 1987.

DAVID P. CIAMPA, Assistant Professor of Physics; B.A., University of California at Berkley; Ph.D., University of Michigan at Ann Arbor; Appointed 2010.

GISELE R. CINQ-MARS, Part-time Adjunct Faculty in Bath Iron Works Apprenticeship Program Department of Engineering; A.S., Bay Path College; B.A., American International College; M.Ed., University of Maine; Appointed 2008.

[ANN CLEVELAND](#), Chair, Corning School of Ocean Studies; Associate Professor of Marine Biology; B.A., University of New Hampshire; M.S., University of Rhode Island; Ph.D., Northern Arizona University; Appointed 2002.

STEPHEN COLE, Assistant Professor of Marine Transportation Operations; B.S., Maine Maritime Academy; M.S., University of Maine; Master, Steam or Motor Vessels, Unlimited; Appointed 2010.

[STEPHEN A. COLLINS](#), Professor of Welding; B.A., University of California; B.S., University of Southern Maine; M.A.Ed., University of Phoenix; AWS Certified Welding Inspector; Appointed 1992.

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[HARRIS W. ERLANSON](#), Part-time Adjunct Faculty in Marine Transportation and Second Mate, *T.S. State of Maine*; B.S., Maine Maritime Academy; Chief Mate, Steam or Motor Vessels, Unlimited; Master, 1600 ton; Appointed 1997.

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ROBERT T. GIFFIN, Assistant Professor of Mechanical Arts; B.S., University of Southern Maine; Appointed 1978.

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SARAH F. HUDSON, Associate Professor of Ship's Medicine; B.A., Colby College; State of Maine Licensed Advanced EMT, EMS Instructor Coordinator, Radiologic Technologist; Appointed 1989.

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DAVID B. VELLENGA, Distinguished Visiting Professor of Global Supply Chain Management; A.B., Calvin College; M.B.A., The University of Illinois at Urbana; Ph.D., The Pennsylvania State University; Appointed 2004.

[ALAN VERDE](#), Associate Professor of Marine Biology; B.S., M.S., Walla Walla University; Ph.D., Florida Institute of Technology; Appointed 2004.

[LAURENCE V. WADE](#), Part-time Adjunct Faculty in Marine Transportation, and Master, *T.S. State of Maine*; B.S., Maine Maritime Academy; Master, Steam or Motor Vessels, Unlimited; Appointed 1996.

JEFFREY WILLMANN, Associate Professor of Mathematics; B.S., Tufts University; M.Ed., University of Maine; Appointed 1991.

PAUL A. WLODKOWSKI, Associate Professor of Engineering; A.B., Dartmouth College; M.S., University of Virginia; Ph.D., University of Maryland; Appointed 2002.

ROSEMARY K.M. WYMAN, Part-time Adjunct Faculty in Photography; B.A., Queens College, C.U.N.Y.; M.A., University of West Florida; Appointed 1999.

F. MICHAEL YOUNG, Part-time Adjunct Professor of Engineering; B.S., Maine Maritime Academy; Chief Engineer, Steam or Motor Vessels, Unlimited; Appointed 1991.

## EMERITI FACULTY AND ADMINISTRATION

HAROLD C. ALEXANDER, Professor of Engineering Emeritus; B.S., M.S., Nova Scotia Technical College; Ph.D., Texas A & M University; Registered Professional Engineer; Appointed 1991.

RICHARD S. BABCOCK, Professor of Marine Transportation Emeritus; B.A., Western Michigan University; M.S., Maine Maritime Academy; Master, 100 tons; Appointed 1988.

EDGAR J. BIGGIE, JR., Associate Professor of Physical Education Emeritus; B.S., Ithaca College; M.Ed., University of Maine; Appointed 1968.

VERGE FORBES, Academic Dean Emeritus; B.S., University of Maine; M.Ed., D.P.E., Springfield College; Appointed 1963.

DONNA G. FRICKE, Professor of Humanities and Communications Emeritus; B.A., Gettysburg College; M.A., Ph.D., The Pennsylvania State University; Appointed 1980.

CAROLINE A. HERRICK, Associate Professor of Engineering Emeritus; B.S., Massachusetts Institute of Technology; M.S., University of Southampton, England; Appointed 1981.

GROVES E. HERRICK, Professor of Engineering Emeritus; B.S., M.S., Massachusetts Institute of Technology; M.S. University of London; Ph.D., University of Southampton, England; D.I.C. Imperial College, London; Registered Professional Engineer; Appointed 1974.

G. ALBERT HIGGINS, JR., Academic Dean Emeritus; B.A., University of California at Los Angeles; M.A.L.S., Wesleyan University; M.N.S. Worcester Polytechnic Institute; Appointed 1983.

DANIEL J. JONES, Dean of Student Services/Enrollment Management Emeritus; B.S., Marietta College; Appointed 1986.

SHASHI N. KUMAR, Associate Dean of the Loeb-Sullivan School of International Business and Logistics and Professor Emeritus of International Business and Logistics; M.S., Maine Maritime Academy; Ph.D., University of Wales; Master Mariner, United Kingdom; Appointed 1987.

DEAN R. MAYHEW, Associate Professor of History Emeritus; B.A., M.A., University of Maine; Appointed 1963.

MATT MERFELD, Professor of Mathematics Emeritus; B.S., Illinois Institute of Technology; M.Ed., University of Tennessee at Chattanooga; M.A., Ed.D., Rutgers University; Appointed 1970.

WILLIAM J. MOTTOLA, Professor of Physical Education and Director of Athletics Emeritus; B.S., M.S., Ithaca College; C.A.S., University of Maine; Appointed 1967.

WALLACE REED, Professor of Maritime Law and Transportation Management Emeritus; B.S., University of Maine; M.S., Cornell University; J.D., University of Maine School of Law; Appointed 1977.

DONALD SMALL, Professor of Engineering Emeritus; B.S., M.S., University of Maine; Registered Professional Engineer; Appointed 1968.

EUGENE H. SPINAZOLA, Professor of Engineering Emeritus; B.S., Maine Maritime Academy; M.Ed., University of Maine at Farmington; First Assistant Engineer, Steam Vessels, Unlimited; Third Assistant Engineer, Motor Vessels, Unlimited; Registered Professional Engineer; Appointed 1964.

CHARLES B. WEEKS, JR., Professor of Marine Transportation and Nautical Science Emeritus; B.S., M.S., Maine Maritime Academy; Master, Steam or Motor Vessels, Unlimited; Appointed 1972.

## Visiting MMA

WE INVITE YOU to visit Maine Maritime Academy at any time of the year. Allow for a three-hour [visit](#) with any of our capable student guides and admissions counselors in order to digest the breadth of programs and facilities.

[You can get here from there:](#)

From the North, South, and West...

Take Interstate 95 to Bangor, Exit 182, I-395.

Take I-395 to Exit 4, Route 15 South to Bucksport

Follow Route 15 South to Bucksport, 18 miles, which merges with Route 1 North/Route 3.

One mile past Bucksport McDonald's, turn right on Route 175.

After 8 miles, pick up Route 166 to Castine, another 7 miles.

Take first left after the Maine Maritime sign to the Robert S. Walker Admissions and Financial Aid Center.

From the East (coastal)...

Take Route 1 South through Ellsworth..

About 18 miles from downtown Ellsworth, turn left on Route 175.

After 8 miles, pick up Route 166 to Castine, another 7 miles.

Take first left after the Maine Maritime sign to the Robert S. Walker Admissions and Financial Aid Center.

From the East (via Route 9)...

Take Route 9 to Route 46, Eddington, 77 miles.

Follow Route 46, across Route 1A, to Bucksport, 19 miles.

Take left on Route 1 North/Route 3 for 1/2(half) mile.

Turn right on Route 175.

After 8 miles, pick up Route 166 to Castine, another 7 miles.

Take first left after the Maine Maritime sign to the Robert S. Walker Admissions and Financial Aid Center.

Appointments to visit the college should be scheduled well in advance. With prior notice and based on availability, the Admissions Office will provide overnight accommodations without charge for the applicant and his or her family.

For more information, call the Admissions Office toll free: 800-464-6565 in Maine, or 800-227-8465 out-of-state. We encourage you to visit our web site at <http://www.mainemaritime.edu>.

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- [Academic Calendar](#)
- [Academic Policies](#)
- [Undergrad Catalog](#)
- [Graduate Catalog](#)
- [Advisor's Handbook](#)
- [Faculty Handbook](#)
- [Student Handbook](#)
- [Tutoring Schedule](#)

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- [Careers](#)
  
- [Mariner Athletics](#)
- [Graduate Studies](#)
- [Continuing Ed.](#)
- [Conferences](#)
- [Development](#)

## Academic Calendar

UPDATED 5/4/2011

### MAINE MARITIME ACADEMY ACADEMIC CALENDAR 2011-2012

td	August	Orientation Sessions (to be determined)
2	August	Academic Board
17-20	August	NROTC Orientation
18	August	MTO's Return
21	August	Training Begins for Regimental Students
22	August	Begin Add/Drop Period
25-26	August	New Faculty Orientation & Faculty Workshop
26	August	Academic Orientation
28	August	Residence Halls Open
29	August	Commence Fall Semester Classes
31	August	Covocation
2	September	End Add/Drop Period
23	September	Half Semester Course Withdrawal Deadline
24	September	Homecoming
8-10	October	Family Weekend

10	October	Long Weekend - <b><i>no classes</i></b>
14	October	First Year & PFD Student Mid-Semester Grades Published
17	October	Second Half Physical Education Classes Begin
21	October	Full Semester Course Withdrawal Deadline
2-18	November	Registration for Spring Semester & Cruise/Co-op
5	November	Navy/Marine Corps Ball
10	November	Celebration of Achievement Banquet
11	November	Veteran's Day Celebration
11	November	Half Semester Course Withdrawal Deadline
12	November	Saturday Make-up
14-15	November	Readmissions Board
18	November	Commence Thanksgiving Vacation (after last class) Curtis Hall & Dining Hall closed at 1700
27	November	Curtis Hall & Dining Hall Opens
28	November	Resume Classes
9	December	End Classes
11	December	December Graduates Reception
12-16	December	Final Exams
16	December	Commence Vacation (after last exam) Curtis Hall & Dining Hall Closes
20	December	Academic Board
8	January	U.S. Coast Guard Exam Mandatory Meeting
9-12	January	U.S. Coast Guard Exams

9	January	Begin Add/Drop Period
13	January	Faculty Workshop
15	January	Curtis Hall & Dining Hall Opens
16	January	Commence Spring Semester Classes
20	January	End Add/Drop Period
10	February	Half Semester Course Withdrawal Deadline
2	March	PFD Student Mid-Semester Grades Published Curtis Hall & Dining Hall Closes
5-9	March	Spring Break
11	March	Curtis Hall & Dining Hall Opens
12	March	Resume Classes & Second Half Physical Education Classes Begin
16	March	Full Semester Course Withdrawal Deadline
28	March	Regimental Awards Banquet
2-13	April	Registration for Fall Semester
6	April	Half Semester Course Withdrawal Deadline
9	April	Student Life Awards Banquet
13	April	Last Day to Register Before Incurring Late Fee
27	April	Last Day of Classes
30-4	April/May	Final Exams
4	May	Cruise Begins
5	May	Graduation
8	May	Academic Board

8	May	T.S. State of Maine departs
5	June	Auxiliary Sail Cruise Begins (tentative)
2	July	Cruise Ends (tentative)
4	July	Auxiliary Sail Cruise Ends (tentative)

TENTATIVE

MAINE MARITIME ACADEMY  
ACADEMIC CALENDAR  
2012-2013

31	July	Academic Board
tbd	August	Orientation Sessions (to be determined)
22-25	August	NROTC Orientation (tentative)
26	August	Training Begins for Regimental Students
27	August	Begin Add/Drop Period
30-31	August	New Faculty Orientation & Faculty Workshop
31	August	Academic Orientation
2	September	Residence Halls Open
3	September	Commence Fall Semester Classes
5	September	Convocation
7	September	End Add/Drop Period
28	September	Half Semester Course Withdrawal Deadline
29	September	Homecoming
6-8	October	Family Weekend
8	October	Long Weekend - <b>no classes</b>
19	October	First Year & PFD Student Mid-Semester Grades Published

22	October	Second Half Physical Education Classes Begin
26	October	Full Semester Course Withdrawal Deadline
31-16	Oct/Nov	Registration for Spring Semester & Cruise/Co-op
3	November	Navy/Marine Corps Ball
8	November	Celebration of Achievement Banquet
9	November	Veteran's Day Celebration
10	November	Saturday Make-up
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17-21	December	Final Exams
21	December	Commence Vacation (after last exam) Curtis Hall & Dining Hall Closes
27	December	Academic Board
6	January	U.S. Coast Guard Exam Mandatory Meeting
7-10	January	U.S. Coast Guard Exams
7	January	Begin Add/Drop Period
11	January	Faculty Workshop
13	January	Curtis Hall & Dining Hall Opens
14	January	Commence Spring Semester Classes

18	January	End Add/Drop Period
8	February	Half Semester Course Withdrawal Deadline
1	March	PFD Student Mid-Semester Grades Published Curtis Hall & Dining Hall Closes
4-8	March	Spring Break
10	March	Curtis Hall & Dining Hall Opens
11	March	Resume Classes & Second Half Physical Education Classes Begin
15	March	Full Semester Course Withdrawal Deadline
27	March	Regimental Awards Banquet
1-12	April	Registration for Fall Semester
5	April	Half Semester Course Withdrawal Deadline
8	April	Student Life Awards Banquet
12	April	Last Day to Register Before Incurring Late Fee
26	April	Last Day of Classes
29-3	April/May	Final Exams
3	May	Cruise Begins
4	May	Graduation
7	May	Academic Board
7	May	T.S. State of Maine departs
4	June	Auxiliary Sail Cruise Begins (tentative)
1	July	Cruise Ends (tentative)
3	July	Auxiliary Sail Cruise Ends (tentative)

