

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 800 full-time undergraduate students and 10 – 15 graduate students in residence. In addition to the undergraduate students on campus, approximately 50 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.

Student lifestyles reflect the quiet nature of [Castine](#). MMA students have the opportunity 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, 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. Starting in the Fall of 2008, 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 optional but still a valuable experience that can help students find employment 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 also in science, engineering, and business. The Regiment does this by providing a structured training environment where students develop time management skills, self-confidence, enhance their personal value system, and instilling 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 that is 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 after 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 participate in a 60-day [training cruise](#) aboard the [Training Ship, State of Maine](#). During the summer following the sophomore year, midshipmen are assigned to [merchant vessels as cadets](#) to further familiarize them with shipboard procedures. These are exciting times as the students cruise the Caribbean or Europe, making several ports of call while receiving hands-on training in all aspects of ship operation.

Extracurricular Activities

Many campus events take place throughout the year, including films, speakers, 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)

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, yacht club.

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

Career Services

The [Career Services Department](#) is located in Captain Quick Alumni Hall. Career Services Department staff members work with undergraduate students, graduating seniors, alumni, business and industry professionals, and the college administration and faculty. Based on a 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 College library maintains a periodical reading room with many industry-specific magazines and newspapers. The Career Services Department maintains the E. Joseph Farr Resource Room to help students find out more information about specific companies and industry trends. Students are encouraged to begin to develop professional network contacts who are 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 71,000 titles and 2,100 videocassettes, DVDs, and sound recordings. The library subscribes to more than 350 domestic and international periodicals and has extensive retrospective serial holdings, both in print and on microform. 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 Imagery and Mapping Agency and the National Ocean Survey, the library houses nearly 4,800 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, a scanner, and 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 areas are available within the library, as well as tables and individual study carrels in quiet areas on all three floors. Two spacious reading rooms offer commanding views of the campus, while the current periodicals area overlooks Penobscot Bay.

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, Maine 04421-0137, (207) 326-2352, or email mmanrotc@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 \$4000 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:

First year

1. Apply for the SIP Program and Midshipman status in the U.S. Navy Reserve
2. Preliminary selections are made after the Fall semester based on academic record and aptitude
3. Complete a physical examination to verify eligibility
4. Final selections are made after completion of the first year cruise

Sophomore year

1. At the start of the sophomore year, students must agree in writing to apply for, and accept if offered, a Reserve officer's commission
2. Incentive Payments begin with a retroactive payment for the first year
3. Complete Nv-212 (Naval Science for the Merchant Marine Reservist I)
4. Pass Navy physical fitness assessment and swim qualification

Junior year

1. Complete Nv-222 (Naval Science for the Merchant Marine Officer)
2. 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 Nv-402 (Leadership and Ethics) and Nv-442 (Naval Science for the Merchant Marine Reservist II)
4. Be commissioned at graduation as an Ensign in the MMR, USNR
5. If desired, request to be commissioned at graduation as an Ensign in the regular Navy and serve on active duty for a minimum of three years (subject to approval)
6. Pass Navy physical fitness assessment and swim qualification

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, Maine 04421-0137, (207) 326-2352, or email mmanrotc@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, Maine 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. Visit the Admissions site at 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.

If you find yourself missing one or more of the courses below, or didn't perform well in them academically, don't let it deter you from applying. Contact our Admissions staff to discuss plans to get the course(s) you need. To meet our 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 our incoming class.

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 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. Courses with a grade of less than C will be reviewed by the appropriate department chair. It is the responsibility of the student to demonstrate that performance in such courses is equivalent to a grade of C in a similar undergraduate course at Maine Maritime. 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 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. Transfer students are urged to have an interview with the Director of Admissions. Visits or telephone interviews should be planned for weekdays.

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 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 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 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)

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

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

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. 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 certificate 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 has a strong commitment 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. Students must be a high school graduate or must have earned an equivalency certificate.
2. Students 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.

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.

**Applicants 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. All students who are enrolled in a curriculum leading to a US Coast Guard license are automatically subject to random drug testing without notice. 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.

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 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 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 your application is 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.

- 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, e-mail smcdonald@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 Vice President for Academic Affairs 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 degree 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 major 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 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 of Enrollment Management, Dean of Student Services, or the Vice President of 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 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. Based on the colleges' 1998-2004 Integrated Post-Secondary Education Data System (IPEDS) study, Maine Maritime Academy achieves a graduation rate for all first-time B.S. students of 69% within 6 years. For those students enrolled in the U.S. Coast Guard unlimited license program who graduated in 2005, an average passage rate of 100% was realized.

Based on the graduating class of 2006, the average student indebtedness was \$26,508.

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 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. Are male, and registered with the Selective Service
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 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 30. Applications are available from your high school guidance office or Maine Maritime Academy, or on-line at 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 a minimum of \$6.00 per hour and a maximum of \$7.00 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 \$400 to \$4,310 per year and do not have to be repaid.

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.

Veteran's 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 a thank you note to the donor.

Extended Payment Programs

The Academy has agreements with two companies which offer monthly payment plans: Tuition Management Systems and Key Education Resources. Both of these offer 10-month plans with equal payments due July 1 - April 1. Either of these plans can be used to cover all MMA costs or to supplement final costs after financial aid. These companies offer 10-month plans 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 these companies, or contact the Finance Office 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 \$4,000 yearly for four years for 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 December 31 of the award year; or
2. Is a veteran of the U.S. Armed Forces; or
3. Is an orphan or a ward of the court; or
4. Has a spouse or other legal dependents; or
5. Is working on a Master's degree; or
6. Is currently serving on active duty in U.S. Armed Forces for purposes other than training.

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 their 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:

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 total quality points obtained for the grade received in a course is found by multiplying the credit hours of the course by the quality points for the grade received in that course. In determining the grade point average (GPA) for academic standing, all quality points are added, and the total divided by the number of credit hours attempted, including those for courses receiving 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

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. Specified 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

Academic credit may be awarded for life experiences or formal non-academic training. Applicants for such credit should contact the Chair of the appropriate department. Credit is awarded after the applicant successfully completes a test and/or practical project to the satisfaction of the instructor and the appropriate Department Chair who will forward a recommendation to the Academic Dean for consideration. Upon approval of the Academic Dean, the applicant's transcript will be marked to show credit hours earned, and 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.

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). Normally such transfers should take place in the first two weeks in residence.

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 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 appropriate advisors to obtain approval to pursue and receive credit for program specializations.

Minor Guidelines

A minor program generally consists of 18 credit hours of courses related to a specific field of study outside the student's major department 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 Management

Required Courses: Ma-101, Ma-211, Ma-303 and Any 3 of the following: Et-377, Hc-232, Ma-222, Ma-242, Ma-332, Ma-342, Ma-403, Ma-422, Ma-432, Ms-253, Ym-222.

Humanities & Social Science

Required Courses: Hc-112 or 211 and Any Hy, Py, Ge, or Po course (except Po-230 for IBL majors)
Any Hc course except Hc-111 & Hc-232

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.

Logistics Management

Required Courses: Lo-301, Ma-101, and Ma-211 plus
Not more than 1 of the following: Hc-232, Ms-253 and
Any 2 or 3 of the following: Lo-332, Lo-421, Lo-422, Lo-411, Lo-432, Ma-313

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: biology, chemistry, computer science, mathematics, meteorology, marine sciences, 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 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 or Yo-100, 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 and copies of the Academy's annual calendar, contact the Office of the Registrar.

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*, Marine Science 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 of the college 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 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)

licensing 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. A U.S. passport is 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,

e/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; these people can, 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 seven departments which function as administrative units for the organization of faculty, curriculum, and 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 science, 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 (Chair), Pilot; Associate Professors Batt, Bixel, Dobbin, Gilbert, Hudson, Monberg, L. Raikes, Sarna, Schaab, Stone, Willmann; Assistant Professors Anderson, Lorenz, Markhotok; Adjunct Faculty Audette, Bourne, Conte, Corwin, C. Dagan, K. Dagan, Evans, G. Hassett, C. Herrick, G. Herrick, Jennings, C. McKenney, Murphy, Olivari, K. Raikes, Watson, Wyman; Emeritus Professors Biggie, Fricke, Mayhew, Merfeld, Mottola.

The mission of the Arts and Sciences Department is to provide a curriculum that broadens students' knowledge base while guiding students:

- to think critically and creatively
- to write and speak effectively within their chosen discipline
- to demonstrate the power and extent of mathematics and computer science
- to develop and communicate sound, informed opinions
- to identify problems and to propose and implement solutions with confidence
- to solve problems as members of a team
- to appreciate and respect diversity
- to 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 by this department 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, ship's medicine, and physical education.

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 students are required to register for a sailing and a swimming course. Participating varsity athletes may satisfy up to 1 credit hour in Physical Education.

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 and wellness. Emphasis is on water activities such as sailing, swimming, skin and scuba diving, and ocean survival.

Interdisciplinary Studies Major

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 five 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](#)
- [Power Engineering Operations](#)
- [Power Engineering Technology](#)
- [Ship Design](#)
- [Ship Production](#)

International Business and Logistics Major

- [International Business and Logistics](#)

Marine Transportation Majors

The Thompson School of Marine Transportation offers three 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](#)
- [Small Craft Design](#)
- [Small Vessel Systems](#)

Marine Science 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. Students 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 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

International Business & Logistics Options:

A. Logistics Management Package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Lo-301 Business Logistics	3
Lo-313 Intermodal Transportation	3
Lo-332 Materials Management	3
Lo-421 Global Purchasing and Negotiations	3
Ma-101 Introduction to Business Management	3

Ma-211 Financial Accounting	3
Total credits:	24

B. Business Management Package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Ma-101 Introduction to Business Management	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

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

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

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

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
Eg-371 Electrical Power I	3
Et-211 Thermodynamics I	3
PLUS ANY TWO OF THE FOLLOWING:	
Et-201 Fluid Power	3
Eg-252 Machine Tool Operation	2.5
Eg-243 Welding	2
Eg-372 Electrical Power II	3
Eg-392 Diesel Power II	3
Eg-463 Steam Power Plant Operations	3
Total credits:	22.5-24

B. Industrial Powerplant Technology

Eg-101 Fundamentals of Engineering Operations	3
Et-211 Thermodynamics I	3
OR	
Es-251 Engineering Thermo 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

C. Technical Science

Cs-150 Structured Problem Solving	3
Et-211 Thermodynamics I	3
OR	
Es-251 Engineering Thermo 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 Thermo II	3
Et-377 Engineering Economics	3
Total credits:	25

Marine Transportation Options:

Any four of these courses:

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

Any three of these courses:

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

Any one of these courses:

Ns-342 Workboat Operations	3
Ns-345 Shiphandling	3
Ns-341 Auxiliary Sail Operations	3

Total credits	29
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30+ credit packages

International Business & Logistics Options:

A. Logistics Management Package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Lo-301 Business Logistics	3
Lo-313 Intermodal Transportation	3
Lo-332 Materials Management	3
Lo-411 Logistics Information System	3
Lo-421 Global Purchasing and Negotiations	3
Lo-432 Strategic Supply Chain Management	3
Ma-101 Introduction to Business Management	3
Ma-211 Financial Accounting	3
Ma-312 Production and Operations Management	3
Total credits:	33

B. Business Management package

Ec-102 Microeconomics	3
Hc-232 Management Communication	3
Ma-101 Introduction to Business Management	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

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

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

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

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-463 Steam Power Plant Operations	3
Total credits:	34.5

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
Es-251 Engineering Thermo 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:	40

C. Technical Science

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

Marine Transportation Options:

Any four of these courses:

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 Introduction to Cargo Operations	3

Any seven of these courses:

Ns-271&Ns-272 Terrestrial Navigation I & Lab	4
Ns-262 Navigation Rules	3
Ns-292 Electronic Navigation	3
Ns-382 Celestial Navigation	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

Any one of these courses:

Ns-342 Workboat Operations	3
Ns-345 Shiphandling	3
Ns-341 Auxiliary Sail Operations	3
Es-245 Engineering Fluid Mechanics	3
Ns-301 Stability	3
Et-352 Materials Laboratory	3
Et-377 Engineering Economics	3
Total credits:	35

Marine Engineering Operations

The Marine Engineering Operations program is concerned primarily with the operation and maintenance of marine and industrial steam and diesel power plants and with related electrical and refrigeration plants. Classroom studies are closely coordinated with practical experience aboard ship and in laboratories. Successful completion of the program leads to the Bachelor of Science degree and, after passing a federal examination, a Third Assistant 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 MEO program core courses. For the MEO program, core courses are defined as courses with the prefixes Cr, Eg, Et, Ms, Na, and Ps. Students majoring in this program may enroll in any of the minor programs offered at the college. Graduates of this program are eligible to apply for a Maine third class stationary power plant operator's license. Graduates are employed by shipping firms throughout the world, and by power generation and energy production companies.

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

FIRST-YEAR STUDENTS

Fall Semester

Eg-101	Fundamentals of Engineering Operations	2
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Ns-101	Introduction to Nautical Science	2
Et-101	Graphics	3
Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
	Total Credits	15

Each first-year student must pass Pe-114.

Spring Semester

Cs-150	Structured Problem Solving Using Computers	3
Hc-112	Humanities I	3
Ms-110	Technical Calculus I	4
Na-152	Ship Structure and Stability	3
Ps-102	Technical Physics I	4
Pe	Physical Education	1
Mt-12E	Maintenance 4 th Class	
	Total Credits	18

Summer

Cr-103	First-Year Cruise	4
Mt-13E	Summer Maintenance 4 th Class (Optional)	

SOPHOMORES

Fall Semester

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
Mt-21E	Maintenance 3 rd Class	
	Total Credits	16

Spring Semester

Eg-234	Power Equipment Laboratory	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
Et-452	Technical Communications	3
	Total Credits	17.5

Summer

Ce-203	Sophomore Cruise (Cadet Shipping)	4
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JUNIORS

Fall Semester

Eg-321	Steam Turbines I	3
Eg-243	Welding	2
Eg-351	Machine Tool Operations II	2.5
Eg-372	Electrical Power II	3
	Free Elective	3
	Humanities/Social Science Elective	3
	Total Credits	16.5

Spring Semester

Ch-301	Chemical Principles	4
Eg-382	Steam Power Systems I	3
Md-310	Ship's Medicine	3
	Free Elective	3
Mt-32E	Maintenance 2 nd Class	
	Total Credits	13

Summer

Ce-303	Junior Cruise	4
Mt-33E	Summer Maintenance 2 nd Class (Optional)	

SENIORS

Fall Semester

Eg-481	Refrigeration/Air Conditioning.	2.5
Eg-491	Diesel Power III	3
Et-401	Automation and Control	3

Oc-101	Introduction to Ocean Science	3
	Humanities/Social Science Elective	3
Mt-41E	Maintenance 1 st Class	
	Total Credits	14.5

Spring Semester

Eg-422	Steam Power Systems II	3
	Free Elective	3
Eg-431	Gas Turbines	2
Et-377	Engineering Economics	3
	Free Elective	3
	Technical Elective	1-3
	Total Credits	15-17

Credits Required for Graduation: 137.5 -139.5

Additional requirements for graduation:

- a. 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 MEO Program have STCW competencies within the course, and cadets are required to achieve a minimum of 70% grade to obtain credit for these competencies.

Marine Engineering Technology

The Marine Engineering Technology program includes all of the practical ship-board 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 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 field of 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 the Accreditation Board for Engineering and Technology, Inc. (TAC 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	Precalculus Mathematics	4
Ns-101	Introduction to Nautical Science	2

Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
	Total Credits	15

Each first-year student must pass Pe-114.

Spring Semester

Cs-150	Structured Problem Solving Using 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
Mt-12E	Maintenance 4 th Class	
	Total Credits	15

Summer

Cr-103	First-Year Cruise	4
Mt-13E	Summer Maintenance 4 th Class	

SOPHOMORES

Fall Semester

Eg-261	Steam Generators I	3
Eg-292	Diesel Power I	3
Eg-234	Power Equipment Lab	2
Et-201	Fluid Power	3
Hc-211	Humanities II	3
Ps-201	Technical Physics II	4
Mt-21E	Maintenance 3 rd Class	
	Total Credits	18

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
	Total Credits	14.5

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
Et-212	Thermodynamics II	3
Eg-372	Electrical Power II	3
Et-452	Technical Communications	3
	Humanities/Social Science Elective	3
	Total Credits	17.5

Spring Semester

Ch-301	Chemical Principles	4
Eg-382	Steam Power Systems	3
Et-202	Statics & Dynamics	4
Ms-120	Technical Calculus II	4
Hc-112	Humanities I	3
Mt-32E	Maintenance 2 nd Class	
	Total Credits	18

Summer

Ce-303	Junior Cruise	4
Mt-33E	Summer Maintenance 2 nd Class	

SENIORS

Fall Semester

Eg-481	Refrigeration/Air Conditioning	2.5
Eg-422	Steam Power Systems II	3
Et-230	Strength of Materials	3
Et-401	Automation and Control	3
Et-351	Thermo/Fluids Lab	2
	Humanities/Social Science Elective	3
Mt-41E	Maintenance 1 st Class	
	Total Credits	16.5

Spring Semester

Md-310	Ship's Medicine	3
Et-362	Materials	3
Et-432	Power Control Electronics	3
	Humanities/Social Science Elective	3
	Free Elective (Communication Intensive)	3
	Total Credits	15

Credits Required for Graduation: 141.5

Additional requirements for graduation:

- Practical training and regimental requirements as published.
- 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 cadets 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 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 their 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, 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 development of his or her career.
- 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 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 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

Eg-101	Fundamentals of Engineering Operations	2
Es-180	Engineering Design	2
Hc-111	Composition	3
Ms-150	Calculus I	4
Ns-101	Introduction to Nautical Science	2
Cs-151	Introduction to Engineering Programming	3
Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
	Total Credits	17

Each first-year student must pass Pe-114.

Spring Semester

Eg-243	Welding	2
Et-101	Graphics	3
Hc-112	Humanities I	3
Ms-160	Calculus II	4
Ps-162	Physics I	4
Pe	Physical Education	1
Mt-12E	Maintenance 4 th Class	
	Total Credits	17

Summer

Cr-103	First-Year Cruise	4
Mt-13E	Summer Maintenance 4 th Class	

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
Mt-21E	Maintenance 3 rd Class	
	Total Credits	18

Spring Semester

Eg-234	Power Equipment Laboratory	2
Eg-252	Machine Tool Operations I	2.5
Eg-392	Diesel Power II	3
Es-371	Enhanced Electrical Power I	4
Es-352	Engineering Thermodynamics II	3
Ms-252	Engineering Mathematics I	4
	Total Credits	18.5

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
Oc-101	Ocean Science	3
Hc-211	Humanities II	3
Ms-260	Differential Equations	3
	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-380	Engineering Design II	3
Es-490	Numerical and Computer Methods for Engineering	3
Et-452	Technical Communications	3
Mt-32E	Maintenance 2 nd Class	
	Total Credits	18

Summer

Ce-303	Junior Cruise	4
Mt-33E	Summer Maintenance 2 nd Class	

SENIORS

Fall Semester

Eg-481	Refrigeration/Air Conditioning	2.5
Es-420	Engineering Dynamics	3

Ms-251	Probability and Statistics for Engineering and Science	3
Md-310	Ship's Medicine	3
	Humanities Elective	3
Et-401	Automation and Control	3
Mt-41E	Maintenance 1 st Class	
	Total Credits	17.5

Spring Semester

Ch-352	Engineering Chemistry	4
Eg-422	Steam Power Systems II	3
Et-377	Engineering Economics	3
Na-372	Naval Architecture I	3
	Social Science Elective	3
	Total Credits	16

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	3
	Free Elective	1-3
	Total Credits	12-14

Credits Required for Graduation: 175.5-177.5

Additional requirements for graduation:

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

Marine Systems Engineering – Non-License Track

Beginning in the fall of 2003, Maine Maritime Academy admitted students to the Non-License Track of Marine Systems Engineering, 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 Engineers license. Membership in the Regiment of Midshipmen for first-year students only and participation in the first-year cruise is 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 with a major 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

Eg-101	Fundamentals of Engineering Operations	2
Es-180	Engineering Design	2
Hc-111	Composition	3
Ms-150	Calculus I	4
Ns-101	Introduction to Nautical Science	2
Cs-151	Introduction to Engineering Programming	3
Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
	Total Credits	17

Each first-year student must pass Pe-114.

Spring Semester

Eg-243	Welding	2
Et-101	Graphics	3
Hc-112	Humanities I	3
Ms-160	Calculus II	4
Ps-162	Physics I	4
Pe	Physical Education	1
Mt-12E	Maintenance 4 th Class	
	Total Credits	17

Summer

Cr-103	First-Year Cruise	4
Mt-13E	Summer Maintenance 4 th Class	

SOPHOMORES

Fall Semester

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

Spring Semester

Ch-352	Engineering Chemistry	4
Es-235	Engineering Strength of Materials	3
Es-352	Engineering Thermodynamics II	3
Es-380	Engineering Design II	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

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

Spring Semester

Es-245	Engineering Fluid Mechanics	3
Es-371	Enhanced Electrical Power	4
Es-490	Numerical & Computer Methods for Engineering	3
Et-452	Technical Communications	3
Na-372	Naval Architecture I	3
	Technical Elective	2-3
	Total Credits	18-19

Summer

C0-400	Industrial Co-op	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 Math II	3
Na-430	Naval Architecture II	3
	Social Science Elective	3
	Total Credits	19

Spring Semester

Es-510	Engineering Test Lab	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	3
	Total Credits	17

Credits Required for Graduation: 145-148

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 4th-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 will accept 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

Eg-101	Fundamentals of Engineering Operations	2
Hc-111	Composition	3
Ms-101	Pre-calculus Mathematics	4
Cs-150	Structured Problem Solving Using Computers	3
Pe	Physical Education	1
	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-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
Eg-243	Welding	2
	Total Credits	18

Spring Semester

Eg-234	Power Equipment Laboratory	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	3
	Humanities/Social Science Elective	3
	Total Credits	14.5

Spring Semester

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

Summer

Co-301	PEO Cooperative Industrial Field Experience II	2
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SENIORS

Fall Semester

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

Spring Semester

Eg-498	PEO Capstone II	4
Et-482	HVAC	2
Et-377	Engineering Economics	3
	Free Elective	3
	Technical Elective	1-3
	Total Credits	13-15

Credits Required for Graduation: 126 -128

Additional requirements for graduation:

- a. Complete all requirements for and pass the State of Maine Fourth Class Stationary Engineer License Exam. (Note that the eligibility for this license is still under review by the Maine State Boiler Board, but is expected to be finalized before the first students enroll in 2008.)

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 the MMA:

- a. Demonstrated 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	3

Total Credits 16

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

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
Eg-234	Power Equipment Lab	2
	Total Credits	17

SOPHOMORES

Fall Semester

Eg-261	Steam Generators I	3
Eg-243	Welding	2
Et-202	Statics and Dynamics	4
Et-201	Fluid Power	3
Ps-201	Technical Physics II	4
	Total Credits	16

Spring Semester

Eg-242	Machine Tool Practice	1
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	17

Summer

Co-200	Cooperative Industrial Field Experience I	2
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JUNIORS

Fall Semester

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

Spring Semester

Eg-382	Steam Power Systems I	3
Eg-431	Gas Turbines	2
Et-432	Power Control Electronics	3
Et-378	Computer Applications for Power	3
Ch-301	Chemical Principles	4
	Humanities/Social Science Elective	3
	Total Credits	18

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 3
Free Elective 1-3
Total Credits 13-15

Spring Semester

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

Credits Required for Graduation: 131

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 DESIGN AND SHIP PRODUCTION

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- 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	Intro to Marine Engineering	2
EG120	Mechanical Drawing I	3
EG280	Basic Electricity	2
EG201	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	Intro 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
ET235	Material Properties and Testing I	3
ET200	Basic Electronics	2
ET207	Electronics II	2
ET208	Electronics III	3
ET209	Electronics IV	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
ET235	Material Properties and Testing I	3
ET200	Basic Electronics	2
ET207	Electronics II	2
ET208	Electronics III	3
ET209	Electronics IV	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
EG120	Mechanical Drawing I	3
EG215	Blueprint Reading	1
EG240	Welding Technology	1
EG241	Welding Symbols	1
EG103	Introduction to NDE Methods	1
EG105	Liquid Penetrant and Magnetic Particle Methods	1
EG201	Ultrasonic Test Methods	2
EG203	Radiography Methods	2
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
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SHIP PRODUCTION - Outside Machinist 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
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	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
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

Department of International Business and Logistics

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

FIRST-YEAR STUDENTS

Fall Semester

Hc-111	Composition	3
Cs-150	Structured Problem Solving with Computers	3
Ge-200 or Po-230	Geography I or Politics I	3
Ms-141	Finite Mathematics	4
Ma-101	Intro. to Business & Supply Chain Mgmt.	3
Pe	Physical Education	1
	Total Credits	17

Spring Semester

Hc-112	Humanities I	3
Ec-102	Microeconomics	3
Ms-151	Calculus for Business	4
Ge-210 or Po-330	Geography II or Contemporary World Politics II or General Education Elective	3
Py-200 or Ss-200	Social Science Elective	3
Pe	Physical Education	1
	Total Credits	17

SOPHOMORES

Fall Semester

Ec-201	Macroeconomics	3
Bi-101/Ch-210/Ps-102/ Ps-162/Oc-101	Lab Science Elective	4*
	Foreign Language I	3
Ma-211	Financial Accounting	3
Ge-200 or Po-230	Geography I or Politics I	3
	Total Credits	16*

Spring Semester

Ms-253	Statistics for Business and Management	3
Ge-210 or Po-330	Geography II or Politics II or General Education Elective	3
	Foreign Language II/General Education Elective	3
Ma-242	Managerial Accounting	3
Ma-222	Marketing Management	3
	Total Credits	15

Summer Semester

Lo-200	IBL Optional Internship (Dept. Elective)	3
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JUNIORS

Fall Semester

Hc-211	Humanities II	3
	General Education Elective	3
Ma-303	Financial Management	3
Lo-301	Business Logistics	3
Lo-313	Freight Transportation	3
	Total Credits	15

Spring Semester

	General Education Elective	3
Hc-232	Management Communication	3
Ma-342	International Human Resource Management	3
Ma-312	Production and Operations Management	3
Lo-3xx	Global Purchasing & Material Handling	3
	Total Credits	15

Summer Semester

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

Fall Semester

	Free Elective	3
Ma-401	Organizational Behavior	3
Ma-403	International Business	3
Lo-411	Logistics Information System	3
Lo-432	Strategic Supply Chain Management	3
	Total Credits	15

Spring Semester

	General Education Elective	3
	Departmental Elective	3
	Departmental Elective	3
Ma-422	International Business Law	3
Lo-422	International Logistics	3
	Total Credits	15

*Denotes the option to take Oc-101 as a Lab Science course in which case the graduation requirement will be 128 credits.

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

Foreign Language courses may be substituted by 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) 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	Marine Engineering Fundamentals	2
Hc-111	Composition	3
Ms-101	Precalculus Mathematics	4
Ns-101	Introduction to Nautical Science	2
Pe	Physical Education	0.5
Pe-114	Ocean Survival	0.5
	Total Credits	15

Each first-year student must pass Pe-114.

Spring Semester

Ms-110	Technical Calculus I	4
Ns-102	Ship Structure	3
Ps-102	Technical Physics I	4
Hc-112	Humanities I	3
Ns-241	Seamanship	2
Mt-12D	Maintenance 4 th Class	
	Total Credits	16

Summer

Cr-103	First-Year Cruise	4
Mt-13D	Summer Maintenance 4 th Class	

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
Mt-21D	Maintenance 3 rd Class	

Total Credits 17

Spring Semester

Ns-262	Navigation Rules I	3
Ns-282	Celestial Navigation I	3
Ns-292	Electronic Navigation	3
Ns-131	Intro to Marine Transportation	3
Ns-210	Tankerman/PIC	4
	Total Credits	16

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
	Total Credits	16

Spring Semester

Ns-332	Marine Communications	3
Ns-381	Terrestrial Navigation II	3
Ns-221	Meteorology	3
	Free Elective	3
	Free Elective	3
Mt-32D	Maintenance 2 nd Class	
	Total Credits	15

Summer

Cd-303	Junior Cruise	4
Mt-33D	Summer Maintenance 2 nd Class	

SENIORS

Fall Semester

Ns-461	Casualty Analysis	3
Ns-491	Advanced Navigation	3
Ns-499	Topics in Marine Transportation	2
Ns-420	Ship's Business	3
	Technical Elective	3

Mt-41D	Maintenance 1 st Class	
	Total Credits	14

Spring Semester

Hc-232	Management Communications	3
Md-310	Ship's Medicine	3
Ns-498	Watchkeeping	3
	Free Elective	3
	Technical Elective	3
	Total Credits	15

Credits Required for Graduation: 136

Additional requirements for graduation:

- a. 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 (Principles of Economics), Ec-201 (Microeconomics), Ge-200 (World Geography I), or Ge-210 (World 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 Associate degree requisites, 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 Bachelor degree requisites, two additional cooperative work experiences on appropriately-sized vessels, 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 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	Sailing	0.5
Pe-114	Ocean Survival	0.5
Yo-103	Boatyard Operations	2
	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	SVO 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	3
	Total Credits	16

Spring Semester

Ns-221	Meteorology	3
Ns-292	Electronic Navigation I	3
Ns-262	Navigation Rules	3
Yo-298	Topics in Nautical Science	2
Yo-299	License Preparation	1
	Department Elective	3
	Total Credits	15

Credits Required for Graduation: 67

Summer

Yo-303	SVO 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	Shiphandling	3
	Physical Education	0.5
	General Education Elective	3
	Total Credits	15.5

Spring Semester

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

Summer

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

SENIORS

Fall Semester

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

Spring Semester

Md-310	Ship's Medicine	3
Hc-232	Management Communications	3
Ns-461	Casualty Analysis	3
	Business Elective	3
	General Education Elective	3
	Total Credits	15

Total for Bachelor of Science Degree 132 credit hours.

Maritime Management and 200 Ton Limited License

A 30 month program is available 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 Degree that is offered jointly by Maine Maritime Academy in Castine in association 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 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	Firefighting	
	Total Credits	15

Spring Semester

Hc-112	Humanities I	3
Et-101	Graphics	3
Ps-102	Technical Physics	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

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

Td-101	Topics in Design 1	0.5
	Total Credits	8.5

Second Quarter

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

Third Quarter

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

Fourth Quarter

De-202	Design 4	2
Ct-202	Construction 4	3
Cd-301	CAD 3	1
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 Degree that is offered jointly by Maine Maritime Academy in Castine in association 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	Firefighting	
	Total Credits	15

Spring Semester

Hc-112	Humanities I	3
Ns-241	Seamanship	3
Ps-102	Technical Physics	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

FIRST-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.

MARINE SCIENCE MAJORS

The Department of Marine Science 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.

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 more training and experiences on the biological component of marine science. This major provides instruction in basic biology 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.

Marine Science and Marine Biology majors may elect to participate in the Teaching Certification Program. This program prepares students to teach physical sciences in secondary school. By selecting appropriate electives, students may be certified to teach life sciences also.

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 is required in order to go on cruises.

MARINE SCIENCE

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

FIRST-YEAR STUDENTS

Fall Semester

Bi-110	General Biology I	4
Hc-111	Composition	3
Os-101	Introduction to Marine Science	4
Pe	Swim related*	0.5-1
Pe	Physical Education	0.5
Ns-101	Introduction to Nautical Science	2
	Total Credits	14-14.5

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

Spring Semester

Bi-120	General Biology II	4
Ms-150	Calculus I	4
Os-001	Ocean Studies Seminar I	0.5
Os-204	Physical Geology	4
Pe	Physical Education	0.5-1
	Humanities/Social Science Elective	3
	Total Credits	16-16.5

SOPHOMORE YEAR

Fall Semester

Bi-220	Marine Botany* or HH/SS Elective	3-4
Ch-210	Chemistry I	4
Ms-160	Calculus II	4
Os-211	Marine Geology	3
Os-002	Ocean Studies Seminar II	0.5
Pe	Physical Education Elective	0.5
	Total Credits	15-16

*Student is required to either take Bi-220 Marine Botany or Bi-210 Marine Zoology. If student does not take Bi-220 Marine Botany, they should take a HH/SS Elective.

Spring Semester

Bi-210	Marine Zoology** or Free Elective	3-4
Ch-220	Chemistry II	4
Os-003	Ocean Studies Seminar III	0.5
Os-203	Design and Applied Statistics in Science	4
Ps-162	Physics I	4
	Total Credits	15.5-16.5

**Student is required to either take Bi-210 or Bi-220. If student does not take Bi-210, they should take a Free Elective.

JUNIOR YEAR

Fall Semester

Oc-210	Physical Oceanography	4
Os-004	Ocean Studies Seminar IV	0.5
Ps-261	Physics II	4
	Humanities/Social Science or Free Elective	3-4
	Department Elective	3-4
	Total Credits	14.5-16.5

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
	Free Elective	3-4
	Total Credits	13.5-14.5

SENIOR YEAR

Fall Semester

Hc-211	Humanities II	3
Os-006	Ocean Studies Seminar VI	0.5
Os-401	Research Project	3-4
	Department Elective	3-4
	Free Elective	3-4
	Humanities/Social Science Elective	3

Spring Semester

Department Elective	3-4
Department Elective	3-4
Free Elective	3-4
Free Elective	3-4
Total Credits	12-16

Credits required for Graduation: 117-128

MARINE BIOLOGY

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

FIRST-YEAR STUDENTS**Fall Semester**

Bi-110	General Biology I	4
Ch-210	Chemistry I	4
Hc-111	Composition	3
Os-101	Intro to Marine Science	4
	Total Credits	15

Spring Semester

Bi-120	General Biology II	4
Ch-220	Chemistry II	4
Hc-112	Humanities I	3
Ms-101 or MS150	Pre-Calc or 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**

Ch-310	Organic Chemistry	4
Ms-150 or Ms-160	Calc I or Calc II	4
Os-002	Ocean Studies Seminar II	0.5
Bi-220	Marine Botany	4
Ps-102	Tech. 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	Tech. Physics II	4
	Free Elective or Ms-160 (If Ms-150 was taken in previous semester).	3-4
	Total Credits	16.5-17.5

JUNIOR YEAR

Fall Semester

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

Spring Semester

Bi-308	Cell Biology	4
Hc-211	Humanities II	3
Os-005	Ocean Studies Seminar V	0.5
Os-400	Research Prep.	4
Bi-312	Genetics	4
	Total Credits	15.5

SENIOR YEAR

Fall Semester

	Department Elective	3-4
Os-006	Ocean Studies Seminar VI	0.5
Os-401	Research Project	3-4
	Free Elective	3-4
	Humanities/Social Science Elective	3
	Total Credits	12.5-15.5

Spring Semester

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

Credits required for Graduation: 119-127

Under this option, students may participate in two semester-length cooperative work educational experiences, being away for one fall and one spring semester during the last two years. Students should make arrangements through their advisor and Department Chair, if interested in this option.

January Course

A field course in marine science 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 advisor and the Department Chair. This course is open to any student meeting the necessary prerequisites.

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 Science
Eg Engineering Operations	Os Ocean Studies
Es Engineering	Pd Personal Development
Et Engineering Technology	Pe Physical Education
Ge Geography	Po Political Science
Hc Humanities & Communications	Ps Physics
Hy History	Py Psychology
Ll Lifelong Learning	Ym Small Vessel Management
Lo Logistics	Yo Small Vessel Operations
Ma Management	Yt Small Vessel Technology

BIOLOGY

Bi-101: GENERAL BIOLOGY I - 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. Rec. 3, Lab. 3, Cr. 4.

Bi-102: GENERAL BIOLOGY II - A second course in modern biology covering the following topics: 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. Prerequisite: Bi-101. Rec. 3, Lab. 3, Cr. 4.

Bi-110: 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-120: 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-110. 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, the 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 analysis of the biology of fishes. Topics include: anatomy and physiology of fishes, emergence, evolutionary history, and modern classification of fishes, zoogeography of fishes and ecology of fishes in selected habitats. Prerequisites: Bi-101, Bi-102, and Bi-210 or Bi-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-320: BIOLOGICAL EVOLUTION IN MARINE SYSTEMS - An examination of evolutionary processes in marine ecosystems. Topics include Darwinian and non-Darwinian evolution, paleoecology, adaptive radiation of marine organisms, extinctions, extinct species, comparative life-history consequences, and population biology of living marine organisms. Prerequisites: Bi-102 and Bi-210 or Bi-220. 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 intensive 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.

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. Prerequisite: Ms-101. 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. 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, chemical reactions of fundamental importance to organic chemistry. The laboratory will present a survey of analytic methods commonly employed in organic chemistry including NMR, mass spectroscopy, elemental analysis, and gas chromatography. 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, you 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, you must be in good academic standing. Students in a probation or warning status will not be eligible to participate in this course. Prerequisites: Eg-101, Eg-234, Eg-243, Eg-261, Et-101, Et-201, 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, you 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-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: Cs-150, Ma-101 or Ma-211, Ms-110 or Ms-150 or Ms-151, Ms-251 or Ms-253 or Os-203, Department Chair approval 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. Where 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. In the event non-unlimited license students elect to change majors to a licensed program after cruise, they must have the following prerequisites to receive full credit for cruise: Eg-101, Ns-101, Pe-114. 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: participation in the Regiment; completion of the ship's Familiarization/Orientation Program; first year maintenance; and 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 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: Cr-103, Ns-122, Ns-241, Ns-262, Ns-271, Ns-272, 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-110, Cr-210, and Cr-310: OCEAN STUDIES CRUISE - Ocean Studies majors must enroll in Cr-110, Cr-210, and Cr-310, in successive order, for at least three semesters prior to the end of the Junior Spring Term. During each of the three semesters that students are enrolled they will participate in a minimum of one research cruise. These cruises are normally scheduled on weekends and provide at-sea research experience and increasing responsibility for the student. There is no credit

assigned to Cr-110, Cr-210 and Cr-310. Prerequisites: each cruise is a prerequisite for the next in sequence.

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-101, Pe-100, Pe-114, Ns-241, Yt-102 and Firefighting. 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-101, Ns-241, Ns-262, Ns-271, Ns-272, 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 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-101, Ns-241, Pe-100, Pe-114, Yt-102, and Firefighting. 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: hardware, software and network organization of computers, structured solution methods, programming fundamentals, and spreadsheet modeling. 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-210: FORTRAN PROGRAMMING - An intermediate course in computer programming using FORTRAN. Prerequisite: Cs-150. 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. Prerequisite: Ec-102. 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 and precision measuring and layout tools. This course is the same as the first hour of the course Eg-252, Machine Tool Operations. 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: ENGINEERING AND ENVIRONMENTAL ISSUES - This course is a general environmental overview with primary focus on: 1) a discussion on the causes of environmental problems, the changing role of technology and development of preventive technology, ecosystems and how they work; 2) finding balance among population, soil, water, and agriculture; 3) pollution: air, water, atmospheric, solid waste and public policy; 4) resources: biota, refuse, energy, and land. 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 shop student experience in developing advanced machine shop skills. Training includes internal threading, boring and taper turning, external taper turning, knurling and radius turning. Advanced milling machine operations will also be taught. Three 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, 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. 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. 2.

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.

Eg-499: MARINE ENGINEER LICENSE SEMINAR - Lectures and discussions of problems associated with subjects required by the U.S. Coast Guard license examination. This course cannot be used to fulfill the "Technical Elective" requirement in Engineering Department programs. 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. A student must have completed or be concurrently enrolled in Cs-150. 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.

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: Cs-150, 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-410: ENGINEER IN TRAINING REVIEW - A review of topics that are normally covered on the EIT examination, plus material on how the examination is organized. Prerequisite: major in Marine Systems Engineering, Marine Engineering Technology, Power Engineering Technology, or completed a minor in Technical Science or Naval Architecture, senior standing. Rec. 2, Cr. 2.

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-205, 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-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 application 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-102: SOLID MODELING & COMPUTER AIDED DESIGN - This hands-on course will introduce the student to the latest developments in two and three-dimension CAD solid modeling techniques. It will introduce the student to the paradigms involved in creating two and three-dimensional CAD drawings. The students will then begin to use solid primitives and 2D CAD wire frames to create three-dimensional solid models. Students will learn how to modify solids by joining or subtracting solids, and by adding holes, chamfers, fillets, rounds, cuts, and protrusions to solids. Surface modeling techniques will also be addressed, and each student will create a solid model of a boat hull. Additional topics will include the creation of assembly and exploded view drawings. Students will also learn how to create section views and orthographic projection drawings from solid models. Prior CAD experience is helpful but not required. Cr. 1.

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. 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. Prerequisites: Ms-110 and Cs-150 and 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-220: DYNAMICS - The study of moving objects and how forces affect their motion. Prerequisite: Et-202. Rec. 3, 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-392: SHIP'S SYSTEMS - A guided independent study of the engineering systems on the training ship *State of Maine*, patterned after the sea project material in Ce-203, but concentrating on design, rather than operational aspects. Cr. 1.

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 system 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. 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. 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-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 and 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 and 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-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 communications systems. Students will also study development in technological communications 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 with 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-111, 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-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-200: AMERICAN OCEANIC HISTORY - The United States' growth as a maritime power can be traced to the larger history of Western European expansion. This course examines the U.S. as a maritime nation, focusing on the merchant marine. Rec. 3, Cr. 3.

Hy-220: WESTERN CIVILIZATION II - This course carries forward from the story of the Western World's development from the rise of nations to the present day. Rec. 3, Cr. 3.

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-210, Hy-220, 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 WW I through the Great Depression, WW II, the Cold War, the fall of the Soviet Union, and the end of the millennium. Prerequisite: Either Hy-210, Hy-220, Hy-260, Hy-300, 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 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:

These courses are offered through the Office of Continuing Education.

LOGISTICS

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 the Lo-400 required after the junior year. Prerequisite: IBL program coordinator's approval. Cr. 3.

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. 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: Cs-150, Ma-101 or Ma-211, and Ms-251 or Ms-253 or Os-203. 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: Cs-150, Ma-101 or Ma-211 or Ym-222, Ms-110 or Ms-150 or Ms-151, Ms-251 or Ms-253 or Os-203, and any one course in economics (Ec-102 or Ec-201). 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. Study of the material handling and packaging for goods and materials in the warehouse, production operation, and related inbound and outbound transportation. Prerequisites: Cs-150, Lo-301, Ma-101 or Ma-211, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. Rec. 3, Cr. 3.

Lo-400: CO-OP EDUCATIONAL EXPERIENCE IN IBL - See Cooperative Education course listings.

Lo-411: LOGISTICS INFORMATION SYSTEM - 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: Cs-150, Lo-301, Ma-101 or Ma-211, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. 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: Cs-150,

Lo-313, Ma-101 or Ma-211, Ma-403, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. Rec. 3, Cr. 3.

Lo-432: STRATEGIC SUPPLYCHAIN MANAGEMENT - The study of logistics and supply chain potential future shifts and the drivers for those changes. A case study method of exploring current events in supply chain, the 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 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: Cs-150, Lo-301, Lo-313, Lo-332, Lo-411, Ma-101 or Ma-211, and Ms-251 or Ms-253 or Os-203. 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. 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 or Ym-222 and any one course in economics (Ec-102 or Ec-201) or by permission of instructor. 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. 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: Cs-150, Ma-101 or Ma-211, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. 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: Cs-150, Ma-101 or Ma-211, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. 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: Cs-150, Ma-101 or Ma-211, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. 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: Cs-150, Ma-101 or Ma-211 or Ym-222, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. 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: Cs-150, Lo-400, Ma-101 or Ma-211, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203, or by permission of instructor. Rec. 3, Cr. 3.

Ma-403: INTERNATIONAL BUSINESS - A survey introductory course to doing business globally. Course will focus on country differences, theories and issues in cross-border trade and investment, global monetary system and competing in the global marketplace, with special emphasis on entry strategies and modes. Prerequisites: Cs-150, Ma-211, and Ma-303. 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 finale involves a final integration project and presentation based on case study and review of the region that is under consideration. Prerequisites: Cs-150, Ma-101 or Ma-211, Ma-222, Ms-110 or Ms-150 or Ms-151, Ms-251 or Ms-253 or Os-203, or by permission of instructor. 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: Cs-150, Ma-101 or Ma-211, Ma-332, Ma-403, and Ms-251 or Ms-253 or Os-203. Rec. 3, Cr. 3.

Ma-432: INTERNATIONAL MARKETING - This course focuses on the theory and practice of marketing across national borders with an emphasis on the development of appropriate marketing strategies applicable to foreign socioeconomic and cultural environments. Relevant case studies are analyzed. Prerequisites: Cs-150, Ma-101 or Ma-211, Ma-222, Ms-110 or Ms-150 or Ms-151, and Ms-251 or Ms-253 or Os-203. 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. 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: BASIC SHIPBOARD MEDICINE - 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 (ADVANCED SHIPBOARD MEDICINE) - 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, 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. 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. 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. This is a required course for all MTO students. Rec. 3, Lab. 2, Cr. 4.

Ns-221: METEOROLOGY - Basic concepts of meteorology with particular emphasis on the marine applications. 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, line handling and safety procedures relating to all. The course includes material appropriate to functioning as an AB, as well as to efficiently organizing the work of others. Prerequisite: Ns-101. Rec. 2, Lab 2, Cr. 3.

Ns-262: NAVIGATION RULES I - The International and Inland Rules of the Road for preventing collisions at sea. 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 covered 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, 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. Uses and interpretation of radar information, 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: Ns-271 and Ns-272 taken concurrently. 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. Examination of the physical laws affecting a floating body. Effects of cargo operations, loose water, fuel consumption, grounding, and flooding on vessel stability. Examination of cases involving loss of stability. Calculating and adjusting trim. 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, spars, and safety while working aloft. Prerequisite: Ns-241, 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: Advisor approval. Cr. 1.

Ns-400: INDEPENDENT STUDY IN MARINE TRANSPORTATION AND NAUTICAL SCIENCE - Prerequisite: Advisor approval. Cr. 3.

Ns-412: ADVANCED TANKER OPERATIONS - An elective course for deck or engine cadets 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 they are 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, 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 regulatory requirements relating to them are given special attention. Rec. 3, Cr. 3.

Ns-432: SAILING VESSEL CASUALTY ANALYSIS - This course examines both regulatory and non-regulatory issues emerging from several important casualty cases involving large sailing vessels in recent decades. The emphasis is on distilling lessons, not only for the aspiring professional sailor, but for any safety minded mariner. Core issues are stability, design, weather, maintenance, retrofitting older vessels, experience and navigation. Shore-based and shipboard decision making is examined, as are the legal implications, policy ramifications and the process of inquiry. Prerequisite: Ns-101. Rec. 2, Cr. 2.

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. 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 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 - Practical design work on a vessel of the student's choosing under the guidance of the instructor. 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. (Nv-212 equivalent with permission of Professor of Naval Science) Rec. 3, Cr. 3.

Nv-102: NAVAL ENGINEERING - An introduction to basic naval engineering fundamentals, familiarizing students with ship

propulsion, ship supporting subsystems, ship design, damage control, casualty control, and supporting administrative programs. (Eg-101 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. (Hy-200 equivalent with permission of Professor of Naval Science) 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) officers 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 on board a Navy ship by imparting basic information concerning shipboard procedures. (Nv-101 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 the 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. (Ns-271 and Ns-272 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. The course has no prerequisites. 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 20th 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 SCIENCE

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-202: NATURAL DISASTERS AND ENVIRONMENTAL ISSUES - Many natural disasters are the product of the intersection of geological phenomena and human actions. In the lecture portion of this class we will learn the science behind disasters such as earthquakes, volcanoes, landslides, hurricanes, and floods. Case studies will be used to better understand the effect on humans. Human interaction with the environment will be the focus of the laboratory portion of the class. This is complementary to the lecture since this interaction has the potential to create environmental problems that may cause their own disasters. Issues such as population growth, pollution, energy use and global warming will be examined from this perspective. 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.

MARINE SCIENCE

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 to increasing depth and with increasing 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 included in the course are: 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. Prerequisites: 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. Prerequisites: Ch-210 and 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: 1) coral reefs, 2) sea grass beds, 3) mangrove communities, 4) intertidal beaches, and 5) 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: Bi-210 or Bi-220, Oc-210, Os-204, and Os-212. 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, a discrete component of an ongoing research program directed by a faculty member, a critical review of the scientific literature, or a topic in the history or the philosophy of science. Research projects can 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. Cr. 3-4 as appropriate.

Os-499: SPECIAL TOPICS IN OCEAN STUDIES - A course allowing students to pursue topics not normally offered in the curriculum. Proposals are student initiated, in consultation with an instructor, and may be any combination of lecture and laboratory research. Departmental approval required. Cr. 1-3 as appropriate.

PERSONAL DEVELOPMENT

Pd-101 & Pd-102: PERSONAL LEADERSHIP DEVELOPMENT - This course is the first of a series of three leadership development courses. It will 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. 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. 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. 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. 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. 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. 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. 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. 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. Cr. 0.5.

Pe-109: RIFLE SHOOTING - Weapons nomenclature, safety procedures, and firing techniques. Pre-firing, dry range fire, range firing, and post-firing procedures. Practice opportunities and competition. Cr. 0.5.

Pe-111: VOLLEYBALL - Individual skills and how these skills are used in team play. Strategy, rules, and scoring. 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. 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. Rec. 3, Cr. 0.5.

Pe-120: CONTEMPORARY HEALTH ISSUES: SUBSTANCE USE AND ABUSE - Main course objective is to impart information about substance use and abuse that is correct and current. 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. 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. Rec. 1, Lab 2, 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 interaction. 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. 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-221: MARINA MANAGEMENT I - This is an introductory course covering the fundamentals of equipment, facilities, and operations of marinas and boatyards. The course stresses economic impact, organization, planning, and management skills. Rec. 3, Cr. 3.

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.

Ym-412: REGULATION AND COMPLIANCE - This course will address various federal, state, and local laws and regulations (EPA, USCG, OSHA et al) with respect to marina and boatyard management and small vessels. 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 that 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: Yo-203 or consent of instructor. Rec. 3, Cr. 3.

Yo-240: CHARTERING - This course focuses on the history, economic impact, management and operation of the yacht charter industry. Shore side management, marketing aspects and vessel operations will be explored. Challenges facing both the crewed and bare-boat industries will be addressed. 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. Prerequisites: Ns-101 and 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.

Yt-211: INTRODUCTION TO MARINE SURVEYING - An introductory lecture/laboratory course which will cover the problems in marine surveying, types of surveys, and destructive and non-destructive testing. Students will examine various boats

and prepare detailed written condition reports on their findings. Rec. 2, Lab. 2, Cr. 3.

Yt-212: MARINE PRICING AND ESTIMATING - This course covers the fundamentals of estimating and pricing marine service work. Quoting, flat rating, and other systems are considered, as well as pricing structures and discounts. The course will develop an awareness of costs, overruns, and the effects of scheduling. Rec. 3, 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. 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. 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. 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. 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. 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. 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. 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. 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. 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). 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. Cr. 2.

EG215: BLUEPRINT READING METHODS - A study of the sketches and blueprints used by the structural trades. Cr. 1.

EG216: SHEET METAL METHODS - A study of the blueprints and procedures used in the sheet metal trade. Cr. 1.

EG217: PIPEFITTING METHODS - A study of the blueprints and procedures used in the pipefitting trade. Cr. 1.

EG218: ELECTRICAL METHODS - A study of the blueprints and procedures used in the electrical trade. Cr. 1.

EG219: OUTSIDE MACHINIST METHODS - A study of the blueprints and procedures used in the outside machinist trade. 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. Cr. 1.

EG241: WELDING SYMBOLS - Introduction to recognizing, reading, interpreting, and drawing welding symbols. 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. 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. Cr. 3 and 2.

EG280: BASIC ELECTRICITY - Introduction to the nature of electricity: resistance, current, voltage, Ohm's law, network theorems, and AC. Cr. 2.

EG281: ELECTRICITY II - A continuation of Basic Electricity, introduces inductive and capacitive circuits, meters and transformers. Cr. 3.

EG282: ELECTRICITY III - Topics include construction and troubleshooting of AC and DC generators and motors. 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. 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. 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. 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. 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. 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. Cr. 3. Prerequisite: ET208.

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. 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. 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. 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. 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. 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. 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. 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. 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. 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. 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. 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. 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. Cr. 3.

PHYSICS

PS103 and PS203: PHYSICS I and II - An introductory college physics course without calculus. Emphasis on Newtonian mechanics of rigid bodies, fluids, heat and introductory thermodynamics, electricity and magnetism. Other related topics as time permits. 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 this program.

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, 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, 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 and 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, 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, 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. 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 6/5/2007

DIRECTORY

Calls from off-campus:

- 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

Emergency

911 Service is now available in the Castine area – all campus phones require 9 to dial off-campus, therefore to dial 911 direct from campus, dial 9-911.

- Emergency Service - Ambulance 911
- Emergency Service - Fire 911
- Emergency Service - Castine Community Health Services 326-4348
- Emergency Service - Police 911
- Emergency Service - MMA Health Services 295
- Emergency Service - MMA Security 479
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- Bilge Lounge 478
- BIW CAD Lab 705
- Bookstore 430/326-9333
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- CAD Lab - Bath Iron Works Center 705
- Career Services 276
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- Castine Community Health Center 326-4348

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Portland, Maine

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FACULTY

Any links to faculty pages below are developed by their authors. The Academy accepts no responsibility for their content.

HAROLD C. ALEXANDER, Professor of Engineering; B.S., M.S., Nova Scotia Technical College; Ph.D., Texas A & M University; Registered Professional Engineer; Appointed 1991.

DANA ANDERSON, Assistant Professor of Humanities and Communications; B.A., Trinity University; M.A., University of California at Los Angeles; Ph.D., Binghamton University; Appointed 2005.

PAUL J. ARENDARCZYK, Assistant Professor of Naval Science; LT USN; B.S., Maine Maritime Academy; Appointed 2006.

PRISCILLA AUDETTE, Part-time Adjunct Faculty in Communications; B.S., University of California at Los Angeles; M.A., North Dakota State University; Appointed 2002.

JOHN BARLOW, V.P. of Academic Affairs and Academic Dean; Professor of Ocean Studies; B.S., University of Rhode Island; Ph.D., University of Maine; Appointed 1970.

THOMAS BATT, Associate Professor of Humanities and Communications; B.A., Cornell University; M.F.A., Ph.D., University of Massachusetts; Appointed 2005.

PATRICIA B. BIXEL, Associate Professor of History; B.A., Rice University; M.A., Duke University; Ph.D., Rice University; Appointed 2000.

[JOCELINE BOUCHER](#), Associate Dean; Professor of Marine Chemistry; B.A., 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, Assistant Professor of Marine Transportation; B.S., M.M.A., University of Rhode Island; Master Mariner, Steam, Motor and Auxiliary Sail, 1600 tons; Appointed 2006.

JOHN W. BRIDGE, Assistant Professor of Engineering; B.S., United States Air Force Academy; M.S., University of Dayton; Registered Professional Engineer; Appointed 2006.

BRIAN G. BUBAR, Assistant Professor of Engineering; B.S., Maine Maritime Academy; M.S., Clarkson University; Third Assistant Engineer, Steam and Motor Vessels Unlimited; Appointed 2007.

[G. ANDERSON CHASE](#), Professor of Marine Transportation; B.S., Maine Maritime Academy; Master Mariner, Steam and Motor Vessels, Unlimited; Master, 1600-ton sail; Appointed 1987.

[ANN CLEVELAND](#), Chair, Marine Science Department; 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 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.

JOE-ANNE CORWIN, Part-time Adjunct Faculty in Psychology; S.D. M.Ed., West Chester University; Appointed 2001.

MARK A. COTÉ, Chair, Engineering Department; Professor of Engineering; B.S., Maine Maritime Academy; M.S.M.E., Clemson University; M.A. Naval War College; Third Assistant Engineer, Steam, Motor, and Gas Turbine Vessels, Unlimited; Registered Professional Engineer; State of Maine First Class Stationary Engineer; Appointed 1992.

WILLIAM J. DEWITT, Associate Dean of the Loeb Sullivan School of Business; Professor of Logistics; B.A.,

Allegheny College; MBA and Ph.D., University of Tennessee; Appointed 2007.

LES EADIE, Assistant Professor of Marine Transportation; B.S., Maine Maritime Academy; M.B.A., University of Phoenix; Master Unlimited; Appointed 2007.

[DONALD P. ELEY](#), Associate Professor of Marine Transportation; Coordinator of the Small Vessel Operations Program; B.A., Humboldt State University; M.S., Maine Maritime Academy; 200-Ton Master's License; Appointed 1991.

[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 and Motor Vessels Unlimited; Master, 1600 ton; Appointed 1997.

BARBARA H. FLECK, Associate Professor of Engineering; B.S., University of Cincinnati; M.S., Dartmouth College; Registered Professional Engineer; Appointed 1994.

LAURIE FLOOD, Associate Professor of Engineering; B.S., Maine Maritime Academy; M.S., University of Maine; Third Assistant Engineer, Steam and Motor Vessels Unlimited; State of Maine Third Class Stationary Engineer; Appointed 2001.

ROBERT T. GIFFIN, Assistant Professor of Mechanical Arts; B.S., University of Southern Maine; Appointed 1978.

DAVID M. GILBERT, Associate Professor of Humanities and Communications; B.A., Colby College; M.S., University of Southern Maine; Ph.D., Rensselaer Polytechnic Institute; Appointed 1993.

STEVEN R. GOOCEY, Assistant Professor of Naval Science; LT USN; B.S., United States Naval Academy; Appointed 2007.

RICHARD R. GRIMM, Assistant Professor of Naval Science; Major USMC; B.S., The Pennsylvania State University; M.S., Boston University; Appointed 2005.

KAVEH HAGHKERDAR, Professor of Engineering, Automation and Control; B.S., M.S., Maine Maritime Academy; State of Maine First Class Stationary Engineer; U.S.C.G. Chief Engineer Motor and Gas Turbine Unlimited; First Assistant Engineer, Steam Vessels Unlimited; Appointed 1983.

[GEORGE N. HARAKAS](#), Assistant Professor of Chemistry; B.S., Saint Louis University; Ph.D., Texas Tech University; Appointed 2007.

DUKE T. HIGGS, Instructor of Naval Science; GySgt USMC; Appointed 2007.

DAVID HOWARD, Part-time Adjunct Faculty in Engineering, and First Assistant Engineer, *T.S. State of Maine*; B.S., Maine Maritime Academy; First Engineer Motor Unlimited, Second Engineer Steam, Unlimited; Appointed 2000.

SARAH F. HUDSON, Associate Professor of Ship's Medicine; B.A., Colby College; Appointed 1989.

NAVNEET JAIN, Assistant Professor of Supply Chain Management; B.T., Gujarat Agricultural University, India; M.S. Maine Maritime Academy; Appointed 2006.

PAR KETTIS, Part-time Adjunct Faculty in International Business & Logistics; Master of Law, University of Stockholm; Swedish Defense College; Appointed 2002.

RICHARD W. KIMBALL, Assistant Professor of Engineering; B.S.M.E. University of Maine; M.S., Massachusetts Institute of Technology; Ph.D., Massachusetts Institute of Technology; Appointed 2004.

TIMOTHY N. LEACH, Part-time Adjunct Faculty in Marine Transportation and Marine Operations Manager; A.S., Southern Maine Technical College; 100-Ton Master's License; Appointed 1979.

MARK LIBBY, Associate Professor of Engineering; B.S., M.S., Maine Maritime Academy; State of Maine First Class Stationary Engineer; Chief Engineer Steam and Motor Vessels; Appointed 1997.

SUSAN K. LOOMIS, Chair, Arts and Sciences Department; Professor of Humanities and Communications; B.A., Regis College; M.A., University of Maine; Appointed 1985.

PATRICK LORENZ, Assistant Professor of Mathematics and Computer Science; B.A., St. John's University, MN; M.S., Johns Hopkins University; Ph.D., Southern Illinois University; Appointed 2004.

ROGER LOWELL, Part-time Adjunct Faculty in Engineering, and Chief Engineer, *T.S. State of Maine*; B.S., Maine Maritime Academy; Chief Engineer, Steam and Motor Vessels, Unlimited; Appointed 2001.

ANNA A. MARKHOTOK, Assistant Professor of Physics; M.S., St. Petersburg State Technical University, Russia; M.S., Old Dominion University; Ph.D., Ioffe Physico Technical Institute, Russian Academy of Sciences, Russia; Appointed 2006.

LEO H. MAZERALL, Laboratory Instructor - Engineering; Diploma, Wentworth Institute; Appointed 1994.

[BRENDON McAVOY](#), Part-time Adjunct Faculty in Marine Transportation, and Chief Mate, *T.S. State of Maine*; B.S., State University of New York Maritime Academy; M.A., University of Rhode Island; Master, Steam and Motor Vessels Unlimited; Appointed 1998.

[JAMES H. McKENNA](#), Assistant Professor of Marine Biology; B.S., Boston College; Ph.D., University of Rhode Island; Appointed 2007.

PAUL E. MERCER, Associate Professor of Engineering; B.S., Maine Maritime Academy; First Assistant Engineer, Steam and Gas Turbine, Unlimited; Third Assistant Engineer, Motor Vessel, Unlimited; Appointed 2006.

RICHARD MILLER, Instructor of Marine Transportation; B.S., Springfield College; Master, Steam, Motor or Auxiliary Sail Vessels, 500 tons; Appointed 2007.

ALDEN L. MONBERG, Associate Professor of Applied Mathematics; B.A., Ph.D., University of Maine; Appointed 1991.

RAYMOND MOODY, Part-time Adjunct Faculty in Engineering, and Second Assistant Engineer, *T.S. State of Maine*; Chief Engineer Steam Vessels, Unlimited; Appointed 2001.

BRIAN P. MORIN, Assistant Professor of Naval Science; Lt USN; B.A., College of the Holy Cross; Appointed 2006.

[JESSICA F. MUHLIN](#), Assistant Professor of Marine Biology; B.A., Boston University; Ph.D., University of Maine; Appointed 2007.

[DANIEL S. PARROTT](#), Associate Professor of Marine Transportation; B.A., Colby College; M.A., University of Rhode Island; Master, Steam, Motor and Auxiliary Sail, 1600 tons; Third Mate, Steam and Motor Vessels, Unlimited; Appointed 2003.

CHRISTOPHER H. PILOT, Professor of Physics; B.A., Boston University; M.S., Technical University of Munich; Ph.D., Max Planck Institute, Germany; Appointed 1991.

ELAINE S. POTOKEK, Professor of Business; B.A., State University of New York; M.A.T.; University of Chicago; Ph.D., Ohio State University; Appointed 1997.

RALPH PUNDT, Chair, Marine Transportation Department; Associate Professor of Marine Transportation; B.S., Maine Maritime Academy; Master, Steam and Motor Vessels, Unlimited; Appointed 1999.

PATRICIA K. QUIRK, Assistant Professor of Business; B.S.C., Santa Clara University; M.S., Golden Gate University; Appointed 2006.

LEON A. RAIKES, Associate Professor of Humanities; B.A., Kalamazoo College; M.A., American University of Beirut; Ph.D., Michigan State University; Appointed 2006.

GARY L. RAYMOND, Assistant Professor of Naval Science; LT USN; B.S., University of Maine; Appointed 2005.

RICHARD REED, Associate Professor of Engineering; B.S., M.S., University of Maryland; Appointed 1996.

JOHN J. REESE, Assistant Professor of Naval Science; Commander, USN; B.A., University of West Florida; Appointed 2007.

[LAUREN E. SAHL](#), Professor of Ocean Studies; B.S., State University of New York at New Paltz; Ph.D., Texas A & M University; Appointed 1990.

RUDOLPH P. SARNA, Associate Professor of Mathematics and Computer Science; B.S., Colorado State University; M.S., University of Maine; Appointed 1992.

W. PETER SARNACKI, Associate Professor of Engineering; B.S., Maine Maritime Academy; State of Alaska First Class Stationary Engineer; State of Maine Second Class Stationary Engineer; Second Engineer Steam Unlimited; Third Engineer Motor Unlimited; Appointed 1996.

MICHAEL SCHAAB, Associate Professor of Physics, B.S., Iona College; M.A., State University of New York; Appointed 2002.

GEORGE L. SCHATZ, Associate Professor of Economics and Finance; B.A., Moorhead State University; M.A., University of Chicago; M.S., University of Arizona; Third Mate, Steam and Motor Vessels, Unlimited; Appointed 1989.

JAMES D. SETTELE, Professor of Naval Science; Captain, USN; B.S., United States Naval Academy; M.S., George Washington University; Appointed 2006.

DAVID G. SKAVES, Professor of Engineering; B.S., Massachusetts Maritime Academy; M.B.A., University of Maine; Chief Engineer, Steam and Motor Vessels, Unlimited; Registered Professional Engineer; State of Maine First Class Stationary Engineer; Appointed 1986.

LAURIE C. STONE, Associate Professor of Humanities and Communications; B.A., University of Connecticut; M.A.T., University of Hartford; C.A.S., Wesleyan University; Appointed permanent, part-time 2000.

J. SAMUEL TEEL, Professor of Marine Transportation and Nautical Science; B.S., Maine Maritime Academy; Master, Steam and Motor Vessels, Unlimited; Appointed 1982.

ALAN V. TRUNDY, Assistant Professor of Mechanical Arts; B.S., University of Southern Maine; Appointed 1971.

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; Former Dean, Haworth College of Business, Western Michigan University; Appointed 2004.

[ALAN VERDE](#), Assistant Professor of Marine Biology; B.S., M.S., Walla Walla College; 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 and Motor, Unlimited; Appointed 1996.

DAVID WALKER, Part-time Adjunct Faculty in Bath Iron Works Apprentice Program Department of Engineering; A.S., Eastern Maine Vocational Technical Institute; Graduate, BIW Apprentice Program; Appointed 1991.

[CHARLES B. WEEKS, JR.](#), Professor of Marine Transportation and Nautical Science; Faculty Senate Representative; B.S., M.S., Maine Maritime Academy; Master Steam and Motor Vessels, Unlimited; Appointed 1972.

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.

[JOHN D. WORTH, III](#), Part-time Adjunct Faculty in Marine Transportation; B.S., University of Southern Maine; Master, 1600-Ton, 100-Ton Auxiliary Sail; Appointed 2003.

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, Associate Professor of Engineering; B.S., Maine Maritime Academy; Chief Engineer, Steam and Motor Vessels, Unlimited; Appointed 1991.

EMERITI FACULTY AND ADMINISTRATION

RICHARD S. BABCOCK, Professor of Marine Transportation Emeritus; B.A., Western Michigan University; M.S., Maine Maritime Academy; 100-Ton Master's License; Appointed 1988.

EDGAR J. BIGGIE, JR., Associate Professor of Physical Education; B.S., Ithaca College; M.Ed., University of Maine; Appointed 1968.

ALFRED A. BROWN, Associate Professor of Marine Transportation Emeritus; B.S., U.S. Merchant Marine Academy; Master Mariner, Steam and Motor Vessels, Unlimited; Appointed 1991.

VERGE FORBES, Academic Dean Emeritus; B.S., University of Maine; M.Ed., D.P.E., Springfield College; Captain, Maine Maritime Academy; 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; Professor 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 MCKINLEY, Professor of Nautical Science Emeritus; B.S., U.S. Naval Academy; Master, Steam and Motor Vessels, Unlimited; Appointed 1977.

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, and Third Assistant Engineer, Motor Vessels, Unlimited; Registered Professional Engineer; Appointed 1964.

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 Admissions House.

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 Admissions House.

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 Admissions House.

Appointments to visit the college should be scheduled well in advance. With prior notice, the Admissions Office will provide transportation to and from [Bangor International Airport](#) or the [Greyhound](#) and [Concord Trailways](#) bus stations in Bangor, as well as 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>

MAINE MARITIME ACADEMY
ACADEMIC CALENDAR
2008-2009

2	August	1 st SVO Cruise Begins (tentative)
5	August	Academic Board
15	August	1 st SVO Cruise Ends (tentative)
16	August	RA & OL Training
16	August	2 nd SVO Cruise Begins (tentative)
20	August	NROTC Orientation Begins
23	August	End NROTC Orientation & Registration and Orientation for New Students
26	August	Regimental Students Report for RPT
29	August	Meeting of Faculty & Faculty Workshops
29	August	2 nd SVO Cruise Ends (tentative)
1	September	Commence Fall Semester Classes & Registration for PFD Students
5	September	End Add/Drop Period
27	September	Homecoming
10-12	October	Family Weekend
13	October	Long Weekend - no classes
17	October	First Year & PFD Student Mid-Semester Grades Published
20	October	Second Half Physical Education Classes Begin
24	October	Full Semester Course Withdrawal Deadline
5-20	November	Registration for Spring Semester & Cruise/Co-Ops
6	November	Wall of Honor & Scheel Scholars Banquet
8	November	Navy/Marine Corps Ball
11	November	Veteran's Day Celebration
15	November	Saturday Make-up
21	November	Commence Thanksgiving Vacation (after last class) Curtis Hall & Dining Hall closed at 1700
30	November	Curtis Hall & Dining Hall Opens
1	December	Resume Classes
12	December	End Classes
15-19	December	Final Exams
19	December	Commence Vacation (after last exam) Curtis Hall & Dining Hall Closes
23	December	Academic Board

5-9	January	U.S. Coast Guard Exams
9	January	Faculty Workshop
11	January	Curtis Hall & Dining Hall Opens
12	January	Commence Spring Semester Classes & Registration for PFD Students
16	January	End Add/Drop Period
27	February	PFD Student Mid-Semester Grades Published Curtis Hall & Dining Hall Closes
2-6	March	Spring Break
8	March	Curtis Hall & Dining Hall Opens
9	March	Resume Classes & Second Half Physical Education Classes Begin
13	March	Full Semester Course Withdrawal Deadline
25	March	Regimental Awards Banquet
30-10	March/Apr	Registration for Fall Semester
6	April	Student Life Awards Banquet
10	April	Last Day to Register Before Incurring Late Fee
24	April	Last Day of Classes
27-1	April/May	Final Exams
1	May	Cruise Begins
2	May	Graduation
5	May	Academic Board
1	June	Auxiliary Sail Cruise Begins (tentative)
29	June	Cruise Ends (tentative)
30	June	Auxiliary Sail Cruise Ends (tentative)

TENTATIVE

MAINE MARITIME ACADEMY
ACADEMIC CALENDAR
2009-2010

29	July	1 st SVO Cruise Begins (tentative)
4	August	Academic Board
11	August	1 st SVO Cruise Ends (tentative)
13	August	2 nd SVO Cruise Begins (tentative)
15	August	RA & OL Training
19	August	NROTC Orientation Begins
22	August	End NROTC Orientation & Registration and Orientation for New Students
25	August	Regimental Students Report for RPT
26	August	2 nd SVO Cruise Ends (tentative)
28	August	Meeting of Faculty & Faculty Workshops

31	August	Commence Fall Semester Classes & Registration for PFD Students
4	September	End Add/Drop Period
3	October	Homecoming
9-11	October	Family Weekend
12	October	Long Weekend - no classes
16	October	First Year & PFD Student Mid-Semester Grades Published
19	October	Second Half Physical Education Classes Begin
23	October	Full Semester Course Withdrawal Deadline
4-19	November	Registration for Spring Semester & Cruise/Co-op
7	November	Navy/Marine Corps Ball
11	November	Veteran's Day Celebration
12	November	Wall of Honor & Scheel Scholars Banquet
14	November	Saturday Make-up
20	November	Commence Thanksgiving Vacation (after last class) Curtis Hall & Dining Hall closed at 1700
29	November	Curtis Hall & Dining Hall Opens
30	November	Resume Classes
11	December	End Classes
14-18	December	Final Exams
18	December	Commence Vacation (after last exam) Curtis Hall & Dining Hall Closes
22	December	Academic Board
4-8	January	U.S. Coast Guard Exams
8	January	Faculty Workshop
10	January	Curtis Hall & Dining Hall Opens
11	January	Commence Spring Semester Classes & Registration for PFD Students
15	January	End Add/Drop Period
26	February	PFD Student Mid-Semester Grades Published Curtis Hall & Dining Hall Closes
1-5	March	Spring Break
7	March	Curtis Hall & Dining Hall Opens
8	March	Resume Classes & Second Half Physical Education Classes Begin
12	March	Full Semester Course Withdrawal Deadline
24	March	Regimental Awards Banquet
29-9	March/Apr	Registration for Fall Semester
5	April	Student Life Awards Banquet
9	April	Last Day to Register Before Incurring Late Fee
23	April	Last Day of Classes
26-30	April	Final Exams
30	April	Cruise Begins
1	May	Graduation

4	May	Academic Board
1	June	Auxiliary Sail Cruise Begins (tentative)
28	June	Cruise Ends (tentative)
30	June	Auxiliary Sail Cruise Ends (tentative)