MARITIME COLLEGE
STATE UNIVERSITY OF NEW YORK

UNDERGRADUATE COURSE DESCRIPTIONS

For Students Entering
Maritime College
During
2024-25 Academic Year

As of September 24,
2024

Note: The course numbering prefixes for all disciplines are listed below. All courses appear in alphanumeric order according to prefixes and course number.

Accounting: GBAC	Marine Transportation: MT
Biology: BIO	Maritime Technology and Operations: MTO
Chemistry: CHEM	Maritime Tech & Ops Deck Officer: MTOD
Chinese: CHIN	Maritime Tech & Ops Engine Officer: MTOE
Computer Science: CS	Mathematics: MATH
Data Science: DS	Meteorology: METE
Economics: GBEC	Nautical Science: NAUT
Engineering: ENGR	Naval Science: NVSC
English: ENGL	Navigation: NAVG
Environmental Science: ES	Oceanography: OCEA
Finance: GBEC	Physical Education: PE
General Business: GBUS	Physics: PHYS
Geology: GEOL	Professional Studies: PS
History: HIST	Social Science: SS
Humanities: HUMN	Spanish: SPAN
Law: GBLW	Statistics: STAT
Management: GBMG	Transportation Systems: GBTT

General Note on the Scheduling of Courses:

Course descriptions include semester(s) when course is regularly offered (assuming sufficient demand and resources). If no semester indicated, course is an elective offered at discretion of the department.

Definitions of Prerequisite and Corequisite Courses:

The description for a given course will sometimes contain reference to courses that are prerequisites or corequisites for that given course.

A ***prerequisite*** is defined as a course that ***must be completed*** with required minimum grade (passing grade, unless otherwise specified) ***prior to*** taking another course.

A ***corequisite*** is defined as a course that can either be ***completed prior to*** (as detailed above) ***or*** be ***taken in the same semester as*** another course. The published degree curricula and flow charts illustrate the preference for any given corequisite situation.

BIOLOGY

BIO 201 General Biology I
3 class hours, 2 laboratory hours, 4 credits.
Cell types and structure. Hierarchical organizations of organisms. Systematics. Cell division. Genetics. Survey of animal and plant kingdoms.
SUNY-GER: Natural Sciences.
[Fall]

BIO 202 General Biology II
3 class hours, 2 laboratory hours, 4 credits.
Morphology and physiology of viruses, bacteria, fungi, ferns, flowering plants and animals. Ecology. Animal behavior. Evolution.
Prerequisite: BIO 201.
[Spring]

BIO 210 Ecology
3 class hours, 3 credits.
Population and community structure. Intra- and inter-specific competition. Predator-prey. Biodiversity. Mimicry. Co-evolution. Exotic species, Habitats.
Prerequisites: MATH 101 or MATH 111, BIO 202.
[Spring]

BIO 315 Marine Biology
3 class hours, 3 credits.
The marine environment. Classification of marine animals and plants. Challenges of life in the sea. Migration, reproduction & behavior of marine life. Marine ecosystems.
Prerequisite: BIO 202.
[Fall – Even years]

BIO 320 Invertebrate Zoology
3 class hours, 2 laboratory hours, 4 credits.
The invertebrate fauna will be explored in terms of their morphology, physiology, and ecology. The evolutionary relationships among these groups will be investigated. Laboratory exercises will provide for the examination of preserved and/or live specimens of representative members of various phyla.
Prerequisite: BIO 202.
[Fall - Odd years]

BIO 340 Marine Botany
3 class hours, 3 credits.
The study of the taxonomy, evolution, physiology, distribution, ecology, and economic importance of marine vegetation including coastal salt marshes and mangals.
Prerequisite: BIO 202.

BIO 415 Ichthyology
3 class hours, 3 credits.
An extensive study of fishes. Emphasis will be placed on their morphological and physiological characteristics and how adaptations of these help fish meet the challenges presented to them by the aquatic environment.
Prerequisite: BIO 202.
[Spring-Odd Years]

BIO 416 Fisheries Science
3 class hours, 3 credits.
A study of the models used for the evaluation of data relevant to the assessment and management of fish stocks. Concepts of population size, growth and mortality will be explored along with the fisheries management concepts of maximum sustainable yield, catch per unit of effort, and conservation measures and policies.
Prerequisites: BIO 202, BIO 417.
[Spring - Even years]

BIO 417 Biostatistics
3 class hours, 3 credits.
This course covers techniques of inferential statistics and its practice using a statistical software. Topics include review of basic statistics, statistical software, t-test, linear regression, chi-square test, analysis of variance and nonparametric methods such as Mann-Whitney U test and Wilcoxon rank-sum. The analytic methods and applications will be linked to topics in biology or environmental science.
Prerequisite: BIO 201, MATH 101 or 111
[Fall]

BIO 420 Ecotoxicology
2 class hours, 4 laboratory hours, 4 credits.
An experimental approach to ecotoxicology. Techniques to be learned include: heavy metal determination by atomic absorption spectrophotometry, tissue and cell culturing, various field-sampling techniques. Students will design and carry to completion independent research projects and will present their results orally and in the form of a scientific paper.
Prerequisite: Permission of the instructor.

BIO 425 Evolutionary Biology
3 class hours, 3 credits.
Students will study the development of evolutionary theory from antiquity to today. Multiple hypotheses for how life changes over time will be evaluated through analyses of multidisciplinary data including: natural history, experiment evolution, genomics, paleontology, anthropology, and comparative biology drawn from published sources. Students will study evolutionary theory from the Great Chain of Being, to Darwinian natural selection, the Modem Synthesis, ending with contemporary attempts of evolutionary synthesis. Topics covered will include: origin of life, teleology, natural selection, sexual selection, evolutionary constraints, sociobiology, macroevolution, population genetics, and evolution of humans.
Prerequisites: BIO 202.

BIO 610 Special Topics in Biology
3 class hours, 3 credits.
Theoretical and/or experimental investigation of contemporary topics or problems in biology.
Prerequisite: As specified by the department chair.

CHEMISTRY

CHEM 100 Introductory Chemistry
3 class hours, 3 credits.
An introductory course focusing on measurement, structure of matter, stoichiometry, solutions, gases, electronic structure of atoms and chemical bonding. Credit will not be given for both this course and CHEM 121.
Prerequisite: MATH 080.
[Spring]

CHEM 121 General Chemistry I
3 class hours, 3 credits.
A study of the structure, composition and transformations of matter in the aqueous, gaseous and solid states. Stoichiometry, precipitation and oxidation-reduction reactions, thermochemistry, chemical bonding, gas laws, and molecular geometry. Credit will not be given for both this course and CHEM 100. Prerequisite: MATH 080.
SUNY-GER: Natural Sciences (with CHEM 122).
[Fall and Spring]

CHEM 122 General Chemistry I Laboratory
2 laboratory hours, 1 credit.
Corequisite: CHEM 121.
SUNY-GER: Natural Sciences (with CHEM 121).
[Fall and Spring]

CHEM 123 General Chemistry II
3 class hours, 3 credits.
This class is the continuation of CHEM 121. Kinetics, acid-base and solubility equilibria, buffers, pH, chemical thermodynamics, solution properties, electrochemistry, nuclear chemistry and coordination chemistry.
Prerequisite: CHEM 100 or CHEM 121.
[Spring]

CHEM 124 General Chemistry II Laboratory
2 laboratory hours, 1 credit.
Prerequisite: CHEM 122.
Corequisite: CHEM 123.
[Spring]

CHEM 212 Materials Science I
3 class hours, 3 credits.
A course detailing the structures and properties of solid materials. Bonding mechanisms, crystalline structures and imperfections, solidification. Mechanical properties and their dependence on atomic-scale structure. Electrochemical corrosion. Thermal aspects: phase diagrams, isothermal transformation diagrams, heat treatments. Engineering alloys, polymers and ceramics.
Prerequisite: CHEM 100 or CHEM 121.
Corequisite: MATH 101 or MATH 111.
[Fall and Spring]

CHEM 213 Materials Science II
3 class hours, 3 credits.
Comparison of mechanical properties of metals, ceramics, polymers, glasses and composites with emphasis on failure of materials. Modern theory of electrons and atoms. Electrical conduction. Band theory and the classification of materials as conductors, semiconductors and insulators. Dielectrics and capacitors. Optical properties and the laser. Magnetism and magnetic materials.
Prerequisite: CHEM 212.

CHEM 301 Chemistry of Fuels and Lubricants
3 class hours, 3 credits.
An introduction to the chemistry of fuels, combustion and lubricants. Includes topics on chemical thermodynamics, kinetics and emissions.
Prerequisite: CHEM 100 or CHEM 121, MATH 101 or MATH 111.

CHEM 311 Environmental Chemistry
3 class hours, 3 credits.
Natural and pollution-related atmospheric, aquatic and soil chemistry. Mechanisms of smog formation, ozone depletion and global warming; fresh and salt water chemistry and biochemistry, water pollution and ground water contamination. Chemical monitoring techniques and pollution-control technology.
Prerequisite: CHEM 123.
[Fall]
Previously CHEM 220.

CHEM 312 Environmental Chemistry Laboratory
3 laboratory hours, 1 credit.
This course is designed to introduce students to common procedures for analyzing environmental samples such as water, air, and sediments. The techniques include wet methods, such as titrations and extractions, and instrumental methods such as mass spectroscopy, and flow injection analysis. The course also includes coverage of the theory of instrumentation involved in these techniques.
Prerequisite: CHEM 124.
Corequisite: CHEM 311.
[Fall]

CHEM 321 Organic Chemistry
3 class hours, 3 credits.
A first semester course in Organic Chemistry. Nomenclature, structure, synthesis, and reactions of aliphatic organic compounds emphasizing reaction mechanisms and stereochemistry.
Prerequisite: CHEM 123.
[Spring]
Previously CHEM 221.

CHEM 322 Organic Chemistry Laboratory
3 laboratory hours, 1 credit.
Organic Chemistry Lab is intended to be taken simultaneously with the lecture class. The majority of laboratory experiments cover the same content as the Organic Chemistry lecture class however spectroscopic techniques are also included.
Prerequisite: CHEM 124.
Corequisite: CHEM 321.
[Spring]
Previously CHEM 222.

COMPUTER SCIENCE

CS 100 Introduction to Business Computing
2 class hours, 2 credits.
General computer literacy, with emphasis on computers in the business environment. Major concepts and recent developments in hardware, operating systems, applications software, database management, and the internet are presented. Societal and ethical concerns, including issues such as cyber security and software piracy, are also considered.
[Fall and Spring]

CS 101 Computer Laboratory
2 laboratory hours, 1 credit.
A laboratory course covering word processing, spreadsheets, presentations and graphics using Microsoft Office applications.
[Fall and Spring]

CS 131 Introduction to Computer Programming
3 class hours, 3 credits.
An introduction to computer programming in an object-oriented language (such as Python). Topics include: primitive data types and operations; branching and looping; functions; object-oriented programming; functional programming. Other possible topics include data exploration with R.

CS 202 Introduction to Data Science
3 class hours, 3 credits.
An introductory course in obtaining, manipulating, analyzing, and visualizing data. Topics include: Python language basics; importing and exporting various data formats such as JSON, Excel and CSV; Numpy computing library; data processing with Pandas library; webscraping; transforming data; linear regression with sci-kit learn; data visualization.
Prerequisite: CS 131 or ENGR 120.

CS 301 Data Structure & Algorithms
3 class hours, 3 credits.
Techniques and algorithms for organizing and processing data. Data structures considered may include: text and binary files; contiguous and linked lists; stacks and queues; linked lists; trees; graphs. For each data structure, relevant processing algorithms (e.g., for traversing, searching, and sorting) will be considered, including recursive methods.
Prerequisite: CS 131 or ENGR 120.
[Spring]

CS 311 Machine Learning I
3 class hours, 3 credits.
Introduction to Logistic Regression, KNN, Naive Bayes and Decision Trees/Random Forest with Statistics. Project-based. This course cannot be taken with ENGR 396 for credit
Prerequisite: CS 202.
[Fall]

CS 312 Machine Learning II
3 class hours, 3 credits.
Second course on Machine Learning. Includes statistical learning methods such as Hidden Markov Model and MCMC. Unsupervised learning methods and clustering algorithms. Natural language processing using word to vector. With Word2Vec, Sci-Kit Learn. Project-based.
Prerequisite: CS 311 or ENGR 396.
[Spring]

CS 401 Database Systems
3 class hours, 3 credits.
Introductory database concepts; the relational model and normalization; use of a relational database management system; SQL; big data and cloud; use of NoSQL system such as MongoDB.
Prerequisite: CS 202.
[Fall]

CS 411 Deep Learning
3 class hours, 3 credits.
Introduction to Neural Network structures and learning algorithms. Construction of various Neural Network models, including CNN, RNN, and LSTM. Methods in dimensionality reduction and feature extraction via unsupervised learning algorithms.
Prerequisite: CS 311 or ENGR 396, MATH 311
[Fall]

CS 425 Data Science Practicum
3 class hours, 3 credits.
Capstone course for applying data science skills to various types of data in respective concentrations. Includes library information literacy session, guest lectures from various departments, review of various data science methods. Project/presentation based. Students must demonstrate skills in data cleaning, data presentation and data analysis, with analytical methods of statistics or machine learning.
Prerequisite: Senior standing, CS 311 or ENGR 396.
[Spring]

CS 610 Special Topics in Computer Science
1, 2, 3 or 4 credits.
Significant topics in programming languages, software engineering, cybersecurity and machine learning that reflect the interest of both the student and the instructor.
Prerequisite: Determined by the department chair.

DATA SCIENCE

DS 525 Data Science Internship
6 credits.
An internship with a sponsoring industrial firm, requiring the intern to be assigned to duties requiring the practical application of data science, which could include data acquisition, data cleaning, data presentation and data analysis. The intern will keep a daily work log and will retain work samples subject to the approval of their supervisor, as agreed with the intern's faculty advisor. The intern will receive a formal performance review upon completion of the internship and must complete a substantial internship report to receive credit. Prerequisite: Permission of the department chair, and completion of sophomore year in the Data Science program.

ENGLISH

ENGL 090-095 Practice in Writing and Reading I-II
3 class hours, 3 credits each.
Intensive preparation for college level writing and reading. This course may not be used to satisfy any degree requirement.
[Summer (ENGL 090)]

ENGL 101 Freshman English I
3 class hours, 3 credits.
Expository writing and analytic reading of selected texts: ENGL 101 emphasizes writing.
A weekly 75-minute recitation aimed at students who need supplementary work in writing is available. Incoming students identified by the English placement exam as needing such additional preparation will be required to attend the recitation.
SUNY-GER: Communication.
[Fall and Spring]

ENGL 102 Freshman English II
3 class hours, 3 credits.
Expository writing and analytic reading of selected texts: ENGL 102 emphasizes reading.
Prerequisite: ENGL 101.
[Fall and Spring]

ENGL 103 Freshman English II for Engineers
3 class hours, 3 credits.
Expository writing and analytic reading of selected texts: ENGL 103 emphasizes styles and formats needed for students and practitioners of engineering.
Prerequisite: ENGL 101.
[Fall and Spring]

ENGL 213 Latinx Literature
3 class hours, 3 credits.
Introduction to prominent writers from a range of Latinx literary traditions.
Representative literary works from Mexican-American, Dominican-American,
Puerto Rican and other Latinx writers are read and analyzed.
Corequisite: ENGL 101.
SUNY-GER: Diversity, Equity, Inclusion and Social Justice.

ENGL 230 American Authors
3 class hours, 3 credits.
Intensive reading of selected works representative of American authors.
Corequisite: ENGL 101.
SUNY-GER: Humanities.

ENGL 231 British Authors
3 class hours, 3 credits.
Intensive reading of selected works representative of British authors.
Corequisite: ENGL 101.
SUNY-GER: Humanities.

ENGL 250 Drama
3 class hours, 3 credits.
Reading, discussion, and performance of several major plays. Consideration of the drama as a genre.
Corequisite: ENGL 101.
SUNY-GER: The Arts.
Previously ENGL 409

ENGL 407 Poetry
3 class hours, 3 credits.
Reading and discussion of several major poets. Consideration of poetry as a genre.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST or HUMN 100-299.

ENGL 414 Irish Literature
3 class hours, 3 credits.
After a detailed survey of Irish history from ancient myths to contemporary political, economic, and literary developments/realities, students delve into classics of Irish Literature by writers such as Yeats, Synge, O'Casey, Joyce, Friel, and Heaney. Readings for the course are supplemented with a variety of films dealing with Irish history and trips for Irish cultural enrichment.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST or HUMN 100-299.

ENGL 415 Literature of Colonialism
3 class hours, 3 credits.
How does colonialism affect those who have been colonized, and those who are doing the colonizing? This course studies colonialism, as it is expressed in two sets of literary works: those written from the viewpoint of colonizers, and those written from the viewpoint of corresponding colonized peoples. Areas focused on include Africa, India, and Southeast Asia.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 416 Literature of the Sea
3 class hours, 3 credits.
Reading and discussion of works by important European and American authors dealing with maritime themes.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 423 Shakespeare
3 class hours, 3 credits.
Reading and discussion of a representative selection of Shakespeare's plays.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 426 Science and Literature
3 class hours, 3 credits.
A discussion of works of several major scientists and the effects of their work and thought on our culture. Special emphasis on developments which have most influenced modern life. Scientists studied are Galileo, Newton, Darwin, Freud, and Einstein.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 450 Speech
3 class hours, 3 credits.
A course combining theoretical study of speech communication with practical study of public speaking, conferences, and meetings. The class meets in the Television Studio.

ENGL 452 Technical Writing and Studies in Technology and Civilization
3 class hours, 3 credits.
Practice in report writing, research and conference techniques. Reading and discussion of material on the influence of technology on modern civilization.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.
[Fall and Spring]

ENGL 453 Creative Writing
3 class hours, 3 credits.
Writing and marketing prose fiction, with an emphasis on the short story. Students' works are read and discussed, as are works by professional authors.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 454 Journalism
3 class hours, 3 credits.
An introduction to the principles and practices of journalism, this course will explore the role of media, focusing and print and on-line outlets. It will examine what constitutes various types of news stories, how they're conceived, developed, published and received. Students will draft and evaluate various news formats. The course also will examine the legal, ethical and business aspects of media, using print as the basis of comparison.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 456 Web Literacy and Design
3 class hours, 3 credits.
A course combining technical writing with rigorous study of Web design and administration. Applications to both marketing and engineering are explored.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 468 Biography/Autobiography
3 class hours, 3 credits.
An examination of biographies and autobiographies, the most popular genre in America. Students will study the difference between a life told from the outside, and one told by the person who lived it; they will also study two major developments of the Twentieth Century: changing expectations of readers, and a dramatic change in the balance between sincerity and authenticity.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 470 Major British Authors
3 class hours, 3 credits.
Intensive reading of selected works by representative British authors.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 471 Major American Authors
3 class hours, 3 credits.
Intensive reading of selected works by representative American authors.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 472 Major American Writers: 19th Century
3 class hours, 3 credits.
This course will study the writers of the "American Renaissance," and trace the different paths pursued by those who followed them. Readings include selections from the Transcendentalists, the Romantics, the Realists, and the first Modernists.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 474-475 Film I-II
3 class hours, 3 credits each.
Studies in the history of film, in film as an art form, and in the relationship between film and literature.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 477 Film and Fiction Studies
3 class hours, 3 credits.
Studies in the transformation of print texts into visual narrative form. Also, study of the phenomenon known as "novelization." The tensions between traditional linear narrative form and post-modern complexity will also be analyzed.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 478 Asian Cinema
3 class hours, 3 credits.
The study of major Asian filmmakers, with an emphasis on their inter-relations with Western culture. Examination of the historical and cultural backgrounds of films from Japan, China, Hong Kong, and Korea. Directors studied include Kurosawa, Ozu, Kobayashi, Yimou Zhang, John Woo, Tsui Hark, Wong Kar Wai, and Chan-wook Park.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGL 480 Crime Fiction/Crime Film
3 class hours, 3 credits.
"Crime Fiction/Crime Film" is a course about the relationship between crime literature and the American cinema. We will concentrate our studies on the following topics: film genre; the gangster film; "pulp" fiction and hardboiled writing; film noir and neo-noir; Classical and New Hollywood; and the postmodern crime film. We will be reading the work of the classic crime writers Hammett, Chandler, Cain, and Jim Thompson. And we will also be studying the films of many important film directors including D.W. Griffith, Howard Hawks, John Huston, Alfred Hitchcock, Billy Wilder, Martin Scorsese, and Quentin Tarantino.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

ENGINEERING

ENGR 100 Engineering Graphics
2 lab hours, 1 credit.
Interpret and create basic engineering drawings following the standard conventions of engineering graphical communication. Course includes use of computer-aided drafting and basic drafting techniques such as orthographic and 3D modeling with a focus on the concepts of descriptive geometry and improvement of spatial ability.
Prerequisite: MATH 090.
[Fall and Spring]

ENGR 110 Introduction to Engineering Practice
1 class hour, 1 recitation hour, 2 credits.
Students will learn the practical techniques needed to practice engineering effectively, including (1) the presentation of calculations, data, and graphs; (2) communication by email, memoranda, drawings, and specifications; (3) effective documentation of work product; (4) use of and conversions between systems of units; and (5) proper exercise of professional responsibilities in reviewing calculations and written documentation. A simple group design exercise will be conducted as part of the class.
Corequisite: MATH 101 or MATH 111.
[Fall and Spring]

ENGR 120 Programming for Engineers
1 class hour, 2 laboratory hours, 2 credits.
The students will learn to use modern computational tools to analyze engineering problems. This course is an introduction to computer programming for engineering tasks.
Corequisite: MATH 101.
[Fall and Spring]

ENGR 242 Statics
3 class hours, 3 credits.
Statics and introduction to strength of materials. Principles of statics and static equilibrium with vector and classical applications. Includes coverage of frames, trusses, three dimensional structures, friction, and moments of inertia.
Prerequisite: A grade of C- or better in PHYS 102.
Corequisites: ENGR 110, MATH 102.
[Fall and Spring]

ENGR 243 Transport Processes
3 class hours, 3 credits.
An introduction to the properties, terminology, concepts and basic laws of fluid statics and dynamics, thermodynamics and heat transfer.
Prerequisite: PHYS 102 or PHYS 211.
[Fall]

ENGR 244 Dynamics
3 class hours, 3 credits.
Principles governing motion resulting from applied forces. Provides a background in solid dynamics for use in areas such as robotics, vibration, and design from a vector formulation perspective. Topics include particle and rigid body kinematics, force and energy methods applied to particles and rigid bodies in plane motion, and the effects of friction.
Prerequisites: ENGR 242, MATH 102.
[Fall and Spring]

ENGR 290 Circuit Analysis
3 class hours, 3 credits.
Introduction to circuit elements, basic electrical rules, theorems, and laws applicable to DC and AC circuits, first-order transient analysis concept and application, single- and three-phase power connections and analysis, phasor concept and frequency domain analysis, use of electronic simulation techniques in measuring circuit parameters.
Prerequisite: PHYS 201 or PHYS 214.
Corequisite: MATH 102 or MATH 112.
[Fall and Spring]
Previously Electrical Engineering I.

ENGR 292 Digital Electronics
3 class hours, 2 lab hours, 4 credits.
Boolean algebra; logic gates, arithmetic operations, combinational logic circuits, decoders and multiplexers, sequential logic, counters and shifters, ASCII code, data acquisition circuits; three bus CPU architecture. Laboratory experiments exemplify lecture material and include both hard-wired and simulated digital electronic circuits, using hardware descriptive languages (HDLs), e.g.,VHDL or Verilog, when appropriate.
Prerequisite: MATH 101.
[Spring]
Previously ENGR 388.

ENGR 311 Kinematics
3 class hours, 3 credits.
Introduction to kinematic analysis of mechanisms with a goal toward understanding of the properties of motion, relative motion, velocities, accelerations and the relationships to mechanisms in industry. Knowledge of these concepts lead to design of robot manipulators, gears, linkages and transmissions used in mechanical systems. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 244.

ENGR 312 Machine Design
3 class hours, 3 credits.
Application of solid mechanics, dynamic system analysis and strength of materials leading to the selection and design of machine elements as components of a mechanical system. Screws, fasteners, joints, springs, bearings, gears, shafts and power transmission systems components are some of the elements considered. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 347.
[Spring]

ENGR 314 Engineering Economics
3 class hours, 3 credits.
Economic principles are studied which include compound interest, time value of money, equipment replacement and equipment retirement decisions. The course concludes with a discussion of various methods of calculating depreciation. Calculations are performed by formula and by tabulated values. Open only to B.E. students or by permission of department chair.
Prerequisite: MATH 101.
[Fall and Spring]
Previously ENGR 443.

ENGR 341 Fluid Mechanics
3 class hours, 3 credits.
Covers the fundamentals of fluid mechanics, including fluid statics and fluid dynamics, and prepares students for the solution of engineering or naval architecture problems. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 242, MATH 211.
[Fall and Spring]

ENGR 344 Thermodynamics
3 class hours, 3 credits.
The study of problems for the following topics: First and Second Law of Thermodynamics; entropy, reversible and irreversible processes; irreversibility and availability; ideal gas processes, steady state, steady flow processes; power and refrigeration cycles; real gases and equations of state, gas mixtures, psychometrics; combustion processes and heat of reaction. Open only to B.E. students or by permission of department chair.
Prerequisites: MATH 211, PHYS 102.
[Fall and Spring]

ENGR 345 Engineering Statistical Analysis
3 class hours, 3 credits.
The students will learn the use of basic discrete and continuous probability models, simple functions of random variables, statistical inference, construction of statistical models, and basic experimental design techniques including the use of modern statistical computational tools. This course is an introduction to the probabilistic and statistical methods that are part of the modern engineer's repertoire. Credit will not be given for both this course and MATH 251. Open only to B.E. students or by permission of department chair.
Prerequisite: MATH 102.
[Fall and Spring]

ENGR 347 Strength of Materials
3 class hours, 3 credits.
Material stress-strain relationships under axial, biaxial, torsional and flexural loadings, Principal stress analysis. Statically indeterminate flexural stresses and deflection by integration, superposition and energy methods. Combines static modes of loading, dynamic loading and column stresses. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 242, MATH 102.
[Fall and Spring]

ENGR 348 Strength of Materials Lab
2 laboratory hours, 1 credit.
Materials testing techniques: tension, compression shear, torsion, flexure, fatigue and impact test on structural materials. Engineering report of tests required. Analysis of data is emphasized. All students must complete a term project. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 347.
[Fall and Spring]

ENGR 349 Transport Processes Laboratory
2 laboratory hours, 1 credit.
Principles of transport processes and fundamental laboratory techniques demonstrated through formal laboratory experiments and lectures. Experiments may include diesel engine, gas turbine, conduction and convection heat transfer; pumps, dual-pipe heat exchanger, and flow devices. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 344.
Corequisites: ENGR 341, ENGR 351.
[Spring]

ENGR 350 Automation and Control Systems
2 class hours, 2 laboratory hours, 3 credits.
Students will be introduced to analog control systems. Students will learn the modeling and dynamic response of physical systems, and the application of feedback control techniques to these systems. Students will learn analysis techniques including transfer function models, stability analysis, root locus design techniques, and frequency-response design methods. Analysis will include the use of simulation tools. Students will be introduced to both state space models and state space design. Student work will include class projects. Open only to B.E. students or by permission of department chair.
Prerequisite: MATH 212.
[Fall and Spring]
Previously Analog Controls

ENGR 351 Heat Transfer
3 class hours, 3 credits.
Analysis of steady state and transient conduction through plane walls and cylinders. Conduction with and without heat generation (applicable nuclear materials). Analysis and design of fins. Analysis of free and forced convection processes. Analysis of radiation processes for black and gray bodies. Introduction to heat exchanger design. Introduction to numerical methods. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 344, MATH 212.
[Fall and Spring]

ENGR 354 Marine Engineering Design I
3 class hours, 3 credits.
Diesel, steam, and/or gas turbine propulsion system design, including thermal, mechanical and electrical considerations of system components. Heat balances are performed using both hand calculations and computational tools. System losses are considered, and auxiliary components are selected and sized. Term design project required. Credit will not be given for both this course and ENGR 446. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 344.
[Spring]

ENGR 363 Ship Statics
3 class hours, 3 credits.
Theory and calculation of transverse and longitudinal stability, trim, flooding, subdivision and damaged stability. Applications to surface ships, submersibles, and other special vehicle types. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 120, ENGR 242, MATH 102.
Corequisite: ENGR 365.
[Fall]

ENGR 365 Ship Form and Graphics
2 class hours, 2 laboratory hours, 3 credits.
Principles of orthographic projection and descriptive geometry are applied to the special problems of naval architectural graphics, particularly the ship lines drawing. Computer-aided drafting and ship form (hydrostatic) calculations. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 100, ENGR 120, ENGR 242, MATH 102.
[Fall]

ENGR 366 Ship Structure
3 class hours, 2 laboratory hours, 4 credits.
Longitudinal and local strength of ship structures. Analysis of framing, bulkheads, and decks. Role of Regulatory Agencies in establishing structural requirements. Projects include calculation of ship's bending moment, midship section modulus, deck and bulkhead design. Introduction to the finite element method. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 347.
[Spring]

ENGR 368 Ship Design I
2 class hours, 4 laboratory hours, 4 credits.
Techniques of conceptual and preliminary ship design based on economic profitability discussed and applied to a specific type of ship. Trade route analysis, principal dimensions, form, power requirement and stability are determined. Capital (building) costs, operating costs and economic measures of merit are estimated. Each student lays out preliminary lines of a ship to satisfy owner's requirement. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 363.
[Spring]

ENGR 371 Applied Naval Architecture
3 class hours, 3 credits.
Covers the principles of intact and damaged stability and trim, longitudinal strength of ship structures. Also, introduces ship resistance and ship powering calculations. Covers basic ship stability requirements under STCW-95. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to B.E. students not majoring in Naval Architecture or by permission of department chair.
Prerequisite: ENGR 242.
[Fall and Spring]

ENGR 380 Introduction to Electric Machinery
2 class hours, 2 lab hours, 3 credits.
Introduction to electrical power systems for non-electrical engineering majors. Generation, transmission, distribution and utilization of electric power, introduction to single- and three- phase power calculations, magnetic circuits, transformers, three-phase induction machines, synchronous machines, and DC machines. Laboratory emphasizes operating characteristics of transformers and rotating machines. Credit will not be given for both this course and ENGR 395. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 290.
[Fall and Spring]
Previously Electrical Engineering II.

ENGR 383 Signals and Systems
3 class hours, 3 credits.
Introduction to continuous and discrete time signals and systems with emphasis on Fourier analysis. Wide-ranging examples include acoustical, mechanical, and electrical signals and systems; notion of causality, linearity, time invariance and periodicity; Fourier series, discrete and continuous time transforms, frequency response and impulse response; convolution; stability. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 290, MATH 212.
[Fall]
Previously Network Analysis.

ENGR 385 Instrumentation and Measurement
2 laboratory hours, 1 credit.
Introduction to instrumentation and measurement using physical components and breadboards to test circuit theorems covered in ENGR 290, theoretical calculations, simulation and real measurement, data analysis, presentation, professional engineering report writing, use of spreadsheets for data analysis and graphing. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 290.
[Fall]

ENGR 387 Analog Electronics
3 class hours, 2 laboratory hours, 4 credits.
Principles of analog signal amplification, signal conditioning, filtering; operational amplifier circuit analysis and design; principles of operation of diodes, bipolar transistors, field-effect transistors; transistor amplifier analysis and design; laboratory experiments supplement and complement lecture material and include hard-wired and simulated analog electronic circuits. Credit will not be given for both this course and ENGR 390. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 290.
[Fall]

ENGR 390 Applied Electronics
3 class hours, 3 credits.
Introduction to electronic devices and systems for non-electrical engineering majors. Covers basic theory, operating characteristics, and applications of diodes, thyristors, single- and three-phase rectification schemes, bipolar junction transistors, field-effect transistor, switches, operational amplifiers, digital logic gates, MUX and DEMUX, ASCII code and data frames. Credit will not be given for both this course and ENGR 387. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 290.
[Fall and Spring]
Previously Electrical Engineering III.

ENGR 394 Electromagnetic Fields
3 class hours, 3 credits.
Review of vectors, coordinate systems, vector differential operators. Static electric field calculation techniques, work and potential in electrostatic fields, field of electric dipoles, divergence theorem, Laplace's and Poisson's equations, magneto-static field, magnetic characteristics of materials, magnetic circuits, field of solenoid, magnetic moment, Maxwell equations and plane waves, dispersion relation and modeling of transmission lines. Open only to B.E. students or by permission of department chair.
Prerequisites: PHYS 201, MATH 212.
[Fall]

ENGR 395 Electric Machines
2 class hours, 2 laboratory hours, 3 credits.
Electromechanical energy conversion systems, magnetic circuits, transformers, construction, principles of operation, circuit models, analysis, electrical and mechanical characteristics of DC machines, induction machines, synchronous machines, fractional horse power machines. Credit will not be given for both this course and ENGR 380. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 290, ENGR 385, ENGR 394.
[Spring]

ENGR 396 Machine Learning
3 class hours, 3 credits.
Introduction to machine learning and its core models and algorithms. Review of probability concepts, classification, linear and non-linear regression, data-driven model selection, dimension-reduction techniques; programming of statistical models for analyzing large datasets. Emphasis on practical applications such as speech recognition, image compression, medical diagnoses and stock market prediction through project-based assignments. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 120, ENGR 345.
[Spring]
Previously Advanced Programming and Machine Learning

ENGR 398 Control System Theory
2 class hours, 2 lab hours, 3 credits.
Introduction to analysis and design of feedback control systems with emphasis on modeling, characteristics, and applications. Topics cover transfer functions, time domain response, frequency domain response, stability criteria, root locus, Bode diagrams, PID controllers/compensators, digital implementation, etc. Simulation tools will be used extensively in the analysis and design of various control systems. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 120, ENGR 383.
[Spring]

ENGR 412 Ocean Engineering
3 class hours, 3 credits.
Survey of subjects important to engineers dealing with the ocean environment including soil mechanics, marine structures, corrosion, underwater acoustics, under water life support systems, power plants, and pollution. Selected design problems will be reviewed. Open only to B.E. students or by permission of department chair.
Prerequisites: CHEM 212, ENGR 347.

ENGR 418 Mechanical Engineering Design I
3 class hours, 2 laboratory hours, 4 credits.
Introduction of the phases of the design process. Projects will include structural, mechanical, thermo-fluid and electrical considerations of systems and their components. Use of CAD/software as well as economic, environmental, social, ethical, legal aspects, safety and other factors. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 312, ENGR 503.
Corequisites: ENGR 341, ENGR 351, ENGR 380.
[Fall]

ENGR 419 Mechanical Engineering Design II
3 class hours, 2 laboratory hours, 4 credits.
Continuation of ENGR 418 (Mechanical Engineering Design I).
Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 418.
[Spring]

ENGR 423 HVAC System Design
3 class hours, 3 credits.
Principles of heating, ventilating and air conditioning are applied and utilized in the design of HVAC (environmental control) systems. Concepts include thermodynamics, psychrometrics, system calculations, heating and cooling load estimating, duct, pipe and fan sizing, air conditioning system concepts and configuration, hydronic heating, cooling, heating and air process equipment. Open only to B.E. students or by permission of department chair.
Prerequisite: A grade C or better in ENGR 351.
Corequisite: ENGR 341.
[Fall]

ENGR 424 HVAC Systems Operation and Management
3 class hours, 3 credits.
Introduction to commercial HVAC facility systems utilizing vapor compression, absorption and related machinery. Course material includes preparation for urban refrigeration licensing exams, design of building HVAC system machinery, cooling tower and energy management utilizing standard commercial refrigerants. Urban Code used in design of air balancing systems. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 243 or ENGR 344.
[Spring]

ENGR 425 Facilities Engineering Design I
4 class hours, 4 credits.
An introduction to the design, construction, operation, maintenance and management of major facilities. The principles of transport processes, electrical theory and strength of materials are used to understand the function and determine the design requirements of the various engineering subsystems present in modern facilities, such as large medical centers, building complexes and other infrastructure. Open only to Facilities Engineering majors.
Prerequisites: ENGR 347, ENGR 354, ENGR 424.
Corequisites: ENGR 380, ENGR 423.
[Fall]

ENGR 426 Facilities Engineering Design II
4 class hours, 4 credits.
Continuation of ENGR 425 (Facilities Engineering Design I). The techniques of engineering project management are applied to the planning, design, construction and commissioning of new facilities as well as the systematic operation, management, maintenance and modification of existing facilities. Open only to Facilities Engineering majors.
Prerequisite: ENGR 425.
Corequisite: ENGR 444.
[Spring]

ENGR 440 Marine Engineering Design II
2 class hours, 2 laboratory hours, 3 credits.
Continuation of ENGR 354 (Marine Engineering Design I); includes a semester project involving the engineering design of a vessel propulsion plant and support systems. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 120, ENGR 345, ENGR 347, ENGR 354.
[Fall]

ENGR 444 Engineering Project Management
3 class hours, 3 credits.
The objectives of this course are to (1) develop knowledge of the uncertain environment of project management, which is especially challenging because of the uniqueness and magnitude of technological projects, and the use of tools such as multiple regression and basic decision theory to deal with these uncertainties, (2) gain knowledge of network analysis tools (i.e., PERT/CPM) for project resource allocation and time management, while remaining aware of the pitfalls and limitations of these tools, and (3) develop a sense of the interpersonal and organizational components of project management, especially the group dynamics of teams engaged in a complex technological effort. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 314.
[Spring]

ENGR 446 Marine Engine Theory and Application
3 class hours, 3 credits.
The application of thermodynamics, fluid dynamics, and heat transfer to the design of marine engineering systems, including steam power plants, diesel power plants, waste heat recovery, refrigeration and other auxiliary systems. Credit will not be given for both this course and ENGR 354. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 243 or ENGR 344.
[Spring]

ENGR 450 Marine Engineering Design III
3 class hours, 2 laboratory hours, 4 credits.
Continuation of ENGR 440 (Marine Engineering Design II), includes a semester project involving the engineering design of multiple shipboard system components. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 341, ENGR 351, ENGR 380. ENGR 440.
[Spring]

ENGR 452 Digital Controls
2 class hours, 2 laboratory hours, 3 credits.
Students will learn digital control techniques for dynamic systems of discrete elements using systems for data sampling. Data sampling systems will include the mathematical representations of analog/digital and digital/analog conversions. Control techniques will be applied to open-loop and closed-loop systems and include the relationships between inputs and outputs. Dynamic analyses will include state-space and stability analyses, and time-domain and frequency-domain analyses. Design of digital controllers will be covered using simulation tools. Class projects will be included. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 350.

ENGR 453 Modern Concepts
3 class hours, 3 credits.
Current approaches to developing power generation projects, including traditional large-scale steam plants (nuclear and fossil fueled), combined cycle technologies, and cogeneration facilities; various types of design documents, including engineering drawings and specifications, that form the basis of a final design. Students learn the comprehensive engineering design process, from preliminary engineering study through final design and construction. Design project, report, and presentation. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 344.
[Fall]

ENGR 454 Vibrations
3 class hours, 3 credits.
Students will gain a fundamental understanding of vibration in mechanical systems. Topics include free vibration of mechanical systems, damping, forced harmonic vibration, support motion, vibration isolation, systems with multiple degrees of freedom, normal modes, free and forced vibrations, vibration absorbers, application of matrix methods, numerical techniques and computer applications. Demonstrations and practical exercises will be used throughout the course. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 244, MATH 212.
[Fall]

ENGR 455 Engineering Approximation
3 class hours, 3 credits.
This course teaches simple reasoning techniques for analyzing complex phenomena. Basic tools include: unit systems and unit conversions, back-of-the-envelope calculations and order-of-magnitude estimation techniques. Analysis methods include: divide-and-conquer hierarchies, dimensional analysis, extreme cases, continuity and scaling laws, successive approximations, balance equations, cheap calculus, and symmetry methods. Applications are drawn from the physical and biological sciences, mathematics, and engineering. Open only to B.E. students or by permission of department chair.
Prerequisite: PHYS 102.

ENGR 456 Computer Aided Engineering
3 class hours, 3 credits.
Fundamentals and applications of computer-aided design, modeling, and analysis. Introduction to the finite element method and use of standard packages for design problems in structural mechanics and heat transfer. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 120, ENGR 312.
Corequisite: ENGR 351.
[Fall]

ENGR 461 Ship Design II
2 class hours, 4 laboratory hours, 4 credits.
Continuation of ENGR 368 (Ship Design I). Preliminary characteristics of a ship of the type examined in Ship Design I are determined to meet owner's requirements. General arrangements, hydrostatics, structural design, speed-power estimate, weights and centers, stability and trim. Extensive use of CAD and computer facilities is required. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 366, ENGR 368.
Corequisite: ENGR 345.
[Fall]

ENGR 462 Ship Resistance and Propulsion
2 class hours, 2 laboratory hours, 3 credits.
Study of resistance and powering of ships. Principle of model testing and similitude for ship hulls and propellers. Standard series calculations. Use of the college's model towing tank for performance of ship resistance and powering tests. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 341.
[Fall]

ENGR 471 Ship Design III
2 class hours, 4 laboratory hours, 4 credits.
Continuation of ENGR 461 (Ship Design II). Course requires students to enter SNAME sponsored ship design competition and meet requirements of the competition. Other design competitions may be substituted with instructor's approval. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 461, ENGR 462.
[Spring]

ENGR 472 Sail Boat Principles and Design
2 class hours, 2 laboratory hours, 3 credits.
Preliminary design techniques for small sail powered craft. Principal dimensions, form, stability, structural design, and speed calculations. Preliminary characteristics to meet owner's requirements. Practical use of CAD and computer facilities. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 363, ENGR 366;
Corequisite: ENGR 462
or
Prerequisites: ENGR 347, ENGR 371.
[Fall]

ENGR 473 Ship Dynamics
3 class hours, 3 credits.
Theory of ship motions in response to ocean waves, and methods of reducing motions. Statistical nature of ship response to waves. Uses ship designed in ENGR 461 and 471. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 244, ENGR 345, ENGR 363, MATH 212.
[Spring]

ENGR 476 Power Boat Principles and Design
2 class hours, 2 laboratory hours, 3 credits.
Preliminary design techniques, motor powered small craft. Principal dimensions, hull form and stability, structural design, speed and/or power requirements. Preliminary characteristics to meet owner's requirements. Practical use of CAD and computer facilities. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 363, ENGR 366
or ENGR 347, ENGR 371.
[Spring]

ENGR 481 Communications Theory
3 class hours, 3 credits.
This course introduces the fundamentals of communication theory with an emphasis on signal modulation. Topics include simple review of Fourier transform, energy and power spectral density, amplitude modulation, frequency modulation, phase modulation, multiplexing technique, pulse modulation, random processes and noises, etc. Coursework includes literature study of IEEE publications that will enable students to learn the latest technologies in communications. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 383, ENGR 387.
[Fall]

ENGR 485 Electrical Power Systems
3 class hours, 3 credits.
Analysis and design aspects of large power systems: system representation; symmetrical components load flow analysis; system protection computer solution methods emphasized. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 380.

ENGR 488 Electrical Design I
2 class hours, 2 laboratory hours, 3 credits.
A project-oriented course in which students integrate engineering codes and standards and their undergraduate knowledge and experience into a design solution and communicate it in oral and written format. Projects may incorporate: control systems, sensor interfaces, electric drives, power electronics, micro-processors, data acquisition, analysis and control through micro programming and electronic communication. Lectures cover knowledge needed to understand and accomplish the design process. Students are evaluated for teamwork, professionalism, engineering ethics, research and life-long learning. At completion, teams have produced a design to enable construction of a model in ENGR 489 Electrical Design II. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 292, ENGR 395, ENGR 396, ENGR 398.
[Fall]

ENGR 489 Electrical Design II
2 class hours, 4 laboratory hours, 4 credits.
Student teams construct a model of the design project assigned in ENGR 488 Electrical Design I. Models are tested for levels of constraint imposed in the theoretical design and data is compared with theoretical calculations. Teams make a number of presentations to demonstrate their progress and are evaluated for project management, incorporation of engineering codes and standards, data collection, data analysis techniques and use of audio and visual software for final presentation. Lectures will address new developments in the field of electrical engineering. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 488.
[Spring]

ENGR 490 Power Electronics & Electric Drives
3 class hours, 2 laboratory hours, 4 credits.
Fundamentals of electromechanical energy conversion, power electronics, and applied control theory in the context of electric drive systems. Electrical drives for: DC machines and four-quadrant operation; induction motors including DTC and V/F. Electric drive systems for switched reluctance and permanent magnet machines (surface-mounted and interior). Systematic design approach to motor drives using simulation tools combined with real experiments. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 387, ENGR 395.
[Fall]

ENGR 494 Introduction to Renewable Energy Resources
3 class hours, 3 credits.
Introduction to distributed energy resources (DER) and renewable energy systems with emphasis on technology and application. Comparison of fossil fuel to renewable energy sources such as solar, biomass, wind, geothermal, and hydroelectric. Net Present Value (NPV) and Life Cycle Cost (LCC) analysis. Topics include operating principles, theoretical and actual energy systems, energy storage, efficiency, microgrids, and smart grids. Open only to B.E. students or by permission of department chair.
Prerequisites: ENGR 290, PHYS 201.
[Spring]

ENGR 495 Marine Electrical Systems
3 class hours, 3 credits.
Governing rules, regulations and design requirements for shipboard electrical systems; sizing ship power equipment; load analysis and system layout; cable sizing; short circuit analysis, system protection and coordination; recent technical developments in marine electrical machinery. Credit will not be given for both this course and ENGR 497. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 380.
[Spring]

ENGR 497 AC and DC Power Distribution Systems
3 class hours, 3 credits.
Introduction to power generation, transmission, and distribution. Review of three-phase concepts, line parameters and ABCD equivalent circuits, power flow studies, and short-circuit calculations. Unbalanced conditions feeder transposition, radial and weakly-meshed distribution systems, distribution load flows, network reduction, and load forecasting. Applications to integrated AC and DC marine power systems will be emphasized. Team projects will be assigned to model, analyze, and/or design an active distribution system using commercial platforms and applicable IEEE codes. Credit will not be given for both this course and ENGR 495. Open only to B.E. students or by permission of department chair.
Prerequisite: ENGR 395.
[Spring]

PROFESSIONAL STUDIES (ENGR 500 – 599)

ENGR 503 Manufacturing Processes I
1 class hour, 3 laboratory hours, 1 credit.
Fundamentals of metal cutting, measuring systems, hand tools and machine tools with major emphasis on basic engine lathe operation. Also includes the use of milling machines, grinders, and drill presses. Safe operation and use of safety equipment is emphasized. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
[Fall and Spring]

ENGR 504 Manufacturing Processes II
1 class hour, 3 laboratory hours, 1 credit.
Manufacturing Processes II offers oxy-acetylene cutting and welding, brazing, arc welding, pipe fitting, and sheet metal fabrication. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
[Fall and Spring]

ENGR 510 Summer Sea Term I
6 credits.
Understanding of the ship's organization. Interrelationship of the components of an operating engine room. Safety of person and ship. Watchstanding, maintenance and repair, and lectures. Responsibility is delegated on the basis of experience and demonstrated ability. In compliance with international STCW requirements, there will be no D or D+ grades in this course. This course also includes required STCW training for Vessel Personnel with Designated Security Duties (VPDSD). Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: ENGR 540, MTO 103, MTO 112. Students must satisfactorily complete Vessel Personnel with Designated Security Duties (VPDSD) training at SUNY Maritime College and Mug Ship Weekend in order to be eligible to take ENGR 510.
[Summer]

ENGR 516 Engineering License Seminar
0 credits.
Lectures, discussion, and study of subjects required by U.S. Coast Guard for federal licensure as an officer in U.S. Merchant Marine. Course is graded Pass/Fail. Examinations are administered to replicate conditions under which Federal exams are given.
Prerequisites: ENGR 503, ENGR 504, ENGR 520 or ENGR 521, ENGR 543, ENGR 544, NAUT 308.
[Summer]

ENGR 520 Summer Sea Term II
6 credits.
Areas of responsibility and depth of knowledge are increased in the overall operations of the vessel under the supervision of the Chief Engineer and the Senior Engineering Training Officer. Safety of person and ship is emphasized. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: ENGR 510, ENGR 541, ENGR 542.
[Summer]

ENGR 521 Cadet Commercial Vessel Shipping (in lieu of Summer Sea Term II)
6 credits.
Exceptionally qualified candidates may, upon application to the Engineering Department, be selected to sail on a commercial ship in lieu of ENGR520. Cadets will be assigned to vessels for approximately 60 days, as required to satisfy the USCG license requirements for sea service, if berths are available. Cadets will be selected based upon academic performance and conduct. An extensive sea project is required. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: ENGR 510, ENGR 541, ENGR 542.
[Summer]

ENGR 526 Industrial Internship I
3 credits.
An internship with a sponsoring industrial firm, requiring the intern to be assigned to duties requiring the practical application of engineering knowledge. These could include such tasks as inspection of existing equipment or systems, inspection of newly completed work, preparation of specifications for renovation or repair work, or development of maintenance plans and programs. The intern will keep a daily work log, and will retain work samples subject to the approval of his/her supervisor, as agreed with the intern's faculty advisor. The intern will receive a formal performance review upon completion of the internship, and must complete a substantial internship report to receive credit.
Prerequisites: Permission of the department chair, and completion of sophomore year in a relevant engineering discipline.
[Summer]

ENGR 530 Summer Sea Term III
5 credits.
Operational responsibilities by the student engineer of all phases of ship work under the supervision of the Chief Engineer and the Senior ENGR Training Officer. Safety of person and ship is emphasized. Each student must take and pass intensive oral and written examinations. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: ENGR 503, ENGR 504, ENGR 520 or ENGR 521, ENGR 543, ENGR 544, NAUT 308, satisfy Ship Work and Training requirements.
Corequisites: ENGR 516, MTO 412.
[Summer]

ENGR 536 Industrial Internship II
3 credits.
An internship with a sponsoring industrial firm, requiring the intern to be assigned to duties requiring the practical application of engineering analysis and design techniques, which could include such tasks as review and application of relevant codes to proposed renovation and repair work, completion of calculations pertaining to performance or sizing of equipment, completion of design specifications, estimates, and drawings, or preparation of reports and presentation materials. The intern will keep a daily work log, and will retain work samples subject to the approval of his/her supervisor, as agreed with the intern's faculty advisor. The intern will receive a formal performance review upon completion of the internship, and must complete a substantial internship report to receive credit.
Prerequisites: ENGR 526, permission of the department chair, and completion of the junior year in a relevant engineering discipline.
[Summer]

ENGR 538 Extended Industrial Internship in Engineering
6 credits.
An internship with a sponsoring industrial firm, requiring the intern to be assigned to duties requiring the practical application of engineering analysis and design techniques, which could include such tasks as review and application of relevant codes to proposed renovation and repair work, completion of calculations pertaining to performance or sizing of equipment, completion of design specifications, estimates, and drawings, or preparation of reports and presentation materials. The intern will keep a daily work log, and will retain work samples subject to the approval of his/her supervisor, as agreed with the intern's faculty advisor. The intern will receive a formal performance review by the faculty advisor upon completion of the internship. This course is intended to be taken in place of the ENGR 526/ENGR 536 sequence.
Prerequisites: Permission of the department chairperson and completion of the junior year in a relevant engineering discipline.
[Summer]

ENGR 540 Introduction to Ship Systems
3 class hours, 1 laboratory hour, 3 credits.
An introduction to ship auxiliary and main propulsion machinery and systems, as well as engine room operation and management. Students are also required to undergo shipboard familiarization and engine room familiarization in preparation for Summer Sea Term I. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Corequisite: MTO 112.
[Spring]

ENGR 541 Ship Systems I
2 class hours, 2 credits.
Design principles, characteristics and classification of marine refrigeration and air conditioning systems. Design principles, characteristics and classification of marine electric systems, including DC and AC circuits, motors and generators. Course covers construction and specification of systems and components, as well as correct operation and maintenance procedures. U.S. Coast Guard design requirements pertaining to each system and its component equipment are covered. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: ENGR 540.
[Spring]

ENGR 542 Ship Systems II
2 class hours, 2 credits.
A continuation of the study of design principles and operating characteristics of marine auxiliary systems. Maintenance procedures, laws and regulations applicable to marine engineering systems are covered. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: ENGR 540.
[Fall]

ENGR 543 Ship Systems III
3 class hours, 2 laboratory hour, 3 credits.
Study of design principles, characteristics and classification suffocation of marine diesel engines. Construction specifications as indicated in the U.S. Coast Guard and ABS ENGR Regulations. Correct procedures for operation and maintenance of auxiliary and main engine diesels, fuels, and combustion. Diesel operation using diesel simulator, miscellaneous systems. A diesel lab is integrated into the course structure to facilitate hands on learning and demonstration of proper engineering practices. The lab will expose students to the practical aspects of diesel engines. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: ENGR 542.
[Fall]

ENGR 544 Ship Systems IV
4 class hours, 4 credits.
Principles, types, construction and description of ship main propulsion engines and their support components. Brief description of steam reciprocating engines; a comprehensive treatment of steam turbines, gas turbines, and electric drive systems together with the auxiliary components which comprise a complete propulsion plant. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: ENGR 542.
[Spring]

ENGR 601 Independent Study in Engineering I
1, 2, 3, or 4 credits.
Theoretical or experimental independent investigation of special topics in engineering. Student work will be under the direct supervision of a mentor approved by the Engineering Department.
Prerequisite: Permission of the department chair.

ENGR 602 Independent Study in Engineering II
1, 2, 3, or 4 credits.
Theoretical or experimental independent investigation of special topics in engineering. Student work will be under the direct supervision of a mentor approved by the Engineering Department.
Prerequisites: ENGR 601, permission of the department chair.

ENGR 610 Special Topics in Engineering
1, 2, 3, or 4 credits.
Theoretical and/or experimental investigation of special problems in engineering.
Prerequisite: As specified by the instructor.

ENGR 631 Undergraduate Research I
3 credits.
This course offers undergraduate engineering students the opportunity to help expand the body of human knowledge by researching a topic on the edge of current engineering understanding. This research experience is a valuable gateway to the personal development of knowledge creation skills which distinguish the best in their fields. Students may take an additional semester of undergraduate research (ENGR 632), but may not apply more than a total of 6 credit hours of undergraduate research to their program of study. This course is intended for students who are capable of advanced studies. Registration requires the express consent of the faculty member who is serving as the research advisor.
Prerequisite: Permission of the department chair.

ENGR 632 Undergraduate Research II
3 credits.
This course offers undergraduate engineering students the opportunity to help expand the body of human knowledge by researching a topic on the edge of current engineering understanding. This research experience is a valuable gateway to the personal development of knowledge creation skills which distinguish the best in their fields. Students may not apply more than a total of 6 credit hours of undergraduate research to their program of study. This course is intended for students who are capable of advanced studies. Registration requires the express consent of the faculty member who is serving as the research advisor for the student's research.
Prerequisites: ENGR 631, permission of the department chair.

ENVIRONMENTAL SCIENCE

ES 101 Introduction to Environmental Science
2 class hours, 2 laboratory hours, 3 credits.
An introduction to the science of the environment. Includes lecture and labs designed to introduce students to concepts and analysis of environmental issues.
[Fall (MES Majors and MES Minors Only) and Spring]
SUNY-GER: Natural Sciences.

ES 303 Geographic Information Systems (GIS)
2 lecture hours, 2 lab hours. 3 credits.
An introduction to the field of Geographic Information Systems (GIS) and ArcGIS PRO. It includes both theoretical and practical elements, providing a general understanding of the subject of spatial theory and hands-on experience. The course begins with the basic elements of a GIS and progresses quickly into the use of ArcGIS PRO software for spatial analysis. Students will complete a final project in which they apply GIS to an environmental problem.
Prerequisite: Junior standing, open only to Marine Environmental Science majors, Data Science majors, and Environmental Science minors.
[Spring]

ES 305 Remote Sensing
2 class hours, 2 laboratory hours, 3 credits.
Principles of remote sensing: electromagnetic and sound energy, and remote sensing systems. Photogrammetry. Radiometry. Orbital dynamics. Electro-optical sensors. Satellite systems. Blackbody radiation. Radar and sonar. Meteorological, oceanographic and biological applications.
Prerequisites: OCEA 101, METE 201, PHYS 214.
[Spring]

ES 410 Marine Microbiology
3 class hours, 3 credits.
A survey of microbes and their role in nutrient cycles, disease, and oil spill remediation. Methodologies for collecting and identifying marine microorganisms.
Prerequisites: BIO 201, CHEM 121.

ES 418 Environmental Sustainability
3 class hours, 3 credits.
This course will cover: (i) global sustainable development goals and sustainability concepts; (ii) critical issues in conservation and sustainability; (iii) sustainability tools and metrics; and (iv) social, ethical and policy issues surrounding conservation and sustainable development. Special focus will include case studies of conservation and development in practice. Topics include biodiversity conservation, forest management, sustainable cities, and food systems.
Prerequisite: BIO 210.
Corequisite: ES 303.
[Spring]

ES 420 Environmental Pollution
3 class hours, 3 credits.
Sources and fates of common selected environmental pollutants; remediation, clean-up and disposal of pollutants; acute and chronic effects of pollutants; case studies of aquatic, terrestrial and atmospheric pollution.
Prerequisite: CHEM 100 or CHEM 121.
[Spring]

ES 430 Environmental Impact Assessment
3 class hours, 3 credits.
The value and role of environmental impact statements. Materials, structural designs, site locations and habitat impact.
Prerequisites: ES 303, CHEM 311.
[Spring]

ES 440 Global Climate Change
3 class hours, 3 credits
This course covers the scientific background needed to understand planetary climate change as a consequence of interconnected solar, geologic, oceanographic, atmospheric, biochemical, and anthropogenic processes. Topics include: ice ages and their causes, the greenhouse effect, modeling and prediction of climate, energy and fossil fuels, the human impact on climate, climate policy, and the consequences of global warming. The course also explores a range of proposed solutions and their potential capacities and limitations.
Prerequisites: ES 101, OCEA 101.

ES 451 Field Methods in Environmental Science
3 class hours, 3 laboratory hours, 4 credits.
A capstone course emphasizing the hands-on lab and field investigative techniques that are used to study the physical, biological, geological, and chemical parameters of the marine environment.
Prerequisites: OCEA 101, BIO 210, CHEM 312, ES 303.
Corequisite: GEOL 101.
[Fall]

ES 505/515 Environmental Science Internship I/II
3 credits each.
Supervised field experience which allows the students to apply and extend their scientific academic abilities in a professional working environment. The hands-on experience may be in environmental science, marine biology, meteorology, or oceanography. Projects can be conducted under the supervision of a researcher not associated with Maritime College; however, a Science faculty member must serve as an internal sponsor and overseer of the project. Two internships may span two academic semesters or may be taken concurrently as a single internship in the summer. The intern will be required to submit a proposal prior to commencement of each internship and a written report along with an evaluation letter from the internship supervisor upon completion.
Prerequisites: Permission of department chair and completion of sophomore year.
[Summer]

ES 610 Special Topics in MES
3 class hours, 3 credits.
Theoretical and/or experimental investigation of contemporary topics or problems in environmental science with a focus on biology, chemistry, meteorology or oceanography.
Prerequisite: As specified by the department chair.

ES 631 Undergraduate Research I
1, 2 or 3 credits.
Undergraduate Marine Environmental Science students engage in an authentic experiential scholarly scientific research project or creative activity under the guidance of a faculty advisor. Students may take an additional semester of undergraduate research (ES 632) but may not apply more than a total of 6 credits of undergraduate research to their program of study
Prerequisite: Permission of chair.

ES 632 Undergraduate Research II
1, 2 or 3 credits.
Undergraduate Marine Environmental Science students engage in an authentic experiential scholarly scientific research project or creative activity under the guidance of a faculty advisor. Students may not apply more than a total of 6 credits of undergraduate research to their program of study
Prerequisite: Permission of chair.

ACCOUNTING

GBAC 311 Financial Accounting
3 class hours, 3 credits.
An introduction to accounting from the point of view of the investor and manager, GBAC 311 covers procedures for recording, summarizing and reporting business transactions, as well as asset valuation, costing and revenue analysis. Emphasis is on an analytical and interpretive approach to generally accept accounting principles that apply to the treatment of assets, liabilities, and capital transactions. The course includes an in-depth examination of corporate financial statements.
Prerequisite: GBUS 100.
[Fall and Spring]

GBAC 315 Managerial Accounting
3 class hours, 3 credits.
Topics of study include forms of business organization, corporation accounting, marketable securities, inventories, cash flows, income tax, and cost accounting for retail, service and manufacturing enterprises.
Prerequisite: GBAC 311.
[Fall and Spring]

ECONOMICS and FINANCE

GBEC 121 Essentials of Macroeconomics
3 class hours, 3 credits.
An analysis of the forces that affect national economies including aggregate levels of production, employment and prices. Particular emphasis on the impact of government spending, taxation and monetary policy. Topics include GDP accounting, business cycles, inflation and unemployment, fiscal policy, national debt, monetary theory, and the framework of international economics.
SUNY-GER: Social Sciences.
[Fall and Spring]

GBEC 122 Essentials of Microeconomics
3 class hours, 3 credits.
An analysis of the economic forces that influence the behavior of firms. Topics include basic demand and supply, price and demand elasticities, costs of production, and the behavior of enterprises under competitive and monopolistic conditions. Resource and labor markets as well as environmental constraints also are studied.
SUNY-GER: Social Sciences.
[Fall and Spring]

GBEC 424 International Economics and Finance
3 class hours, 3 credits.
A study of the patterns of international trade from historical, theoretical and empirical perspectives. Analysis of the economics and policy issues involved in tariffs, bilateral and multilateral trade agreements, and economic unions. International finance from the enterprise and national perspectives. Analysis of trade with developing, middle income and industrial countries and the role played by multinational firms.
Prerequisite: GBEC 122.
[Fall and Spring]

GBEC 427 Financial Management
3 class hours, 3 credits.
An introduction to the financial management of corporations, including statements, ratio analysis, current assets and liability management, capital budgeting, stock and debt financing.
Prerequisite: GBAC 311.
[Fall and Spring]

GBEC 428 Economic Geography
3 class hours, 3 credits.
This course continues the overview begun in GBTT 251 of the global transportation systems that integrate our world as mechanisms that facilitate international trade, from the sourcing of raw materials to the final delivery of products and services to the end customer. Topics include the economic clusters and patterns linked to the geography of our world that affect both supply and demand, and the relationship of these clusters and patterns to cultural, political, and ethical contexts of transportation in globally extended supply chains.
Prerequisite: GBTT 251.
[Fall and Spring]

GBEC 429 Seminar in Transportation Economics
3 class hours, 3 credits.
Economic and managerial analysis of characteristic problems in the transportation industry. Examination of issues such as regulation and deregulation, freight rate setting, service quality, pollution, security and safety, congestion, port management structures, location and land value, social considerations, technology and innovation.
Prerequisite: Senior standing.
[Fall and Spring]

LAW

GBLW 431 Business Law
3 class hours, 3 credits.
Topics include contracts, business torts, agency, white collar crime, the Uniform Commercial Code, product liability, consumer rights, negotiable instruments, real and personal property, bankruptcy and business ethics.
Prerequisite: GBUS 100.
[Fall and Spring]

GBLW 433 Admiralty Law
3 class hours, 3 credits.
Topics include jurisdiction of admiralty courts, rights of seamen, bills of lading, charter parties, cargo claims, maritime liens, insurance, general average, salvage, collisions, limitation of liability, sovereign immunity, pollution and United States Coast Guard proceedings against merchant mariners' licenses.
Prerequisite: GBLW 431.
[Fall and Spring]

GBLW 435 Environmental Law and Policy
3 class hours, 3 credits.
An introduction to the role of administrative agencies and legal institutions in controlling all forms of pollution. Topics include government's environmental responsibilities, energy policy, regulation of air and water pollution, toxic substances, and restrictions on the development of public and private lands. The course considers economic, scientific and technological aspects of administrative and legislative approaches to environmental problems. The evolving role of international law affecting the environment also is discussed.
Prerequisite: Junior standing.
[Fall and Spring]

GBLW 437 International Law
3 class hours, 3 credits.
Topics covered include the sources of international law, sovereignty, the jurisdiction of the nation state and the community of nations, and the status of diplomatic representatives. The law of the sea is examined extensively, including territorial seas, contiguous zones, exclusive economic zones, innocent passage, hot pursuit, freedom of navigation, fishing rights, scientific research and mineral exploitation.
Prerequisite: GBUS 100.
[Fall - Even years]

MANAGEMENT

GBMG 341 Organizational Management
3 class hours, 3 credits.
An examination of the fundamentals of organization and administration including planning, organizing, directing, coordinating, evaluating and controlling. Topics include the structure and processes for managing the organization as a system in a dynamic environment, corporate social responsibility and international dimensions.
Prerequisite: GBUS 100.
[Fall and Spring]

GBMG 345 Fundamentals of Marketing
3 class hours 3 credits.
This course considers the functions performed by marketing intermediaries and the distribution of goods and services from producers to customers.. Topics include the nature and scope of marketing problems, the behavior of consumers and industrial buyers, product design and development, channels of distribution, promotional and pricing strategies, social responsibility and ethics, governmental regulation and international dimensions of marketing.
Prerequisite: GBUS 100.
[Fall and Spring]

GBMG 348 Business Ethics
3 class hours, 3 credits.
The course examines ethical issues, moral principles, values, duties, obligations, and etiquette in the context of business theory and practice. A philosophical framework (e.g. Aristotle) for ethical and moral thinking is set. Ethics as a set of values going beyond the law is studied. Ethical relationships which businesses, and business people, encounter with stakeholders and others are examined and defined. The course text and other readings draw on a wide body of literature, including the humanities, management theory and the social sciences. Actual cases (e.g. Bhopal, *Exxon Valdez*, Enron, Arthur Andersen, WorldCom) are studied for ethical implications. Special issues of ethical conduct within the workplace (e.g. sexual harassment; equal opportunity; whistleblowers; nepotism) are studied and discussed.
Prerequisite: GBUS 100.
[Fall - Odd years]

GBMG 440 Seminar in Strategy and Policy
3 class hours, 3 credits.
An integrative learning experience that relates business knowledge to managerial decision-making. Readings and case analyses test skills in applying management, marketing, financial and other business techniques in competitive situations. Emphasis is on successful performance in a complex and dynamic global business environment.
Prerequisite: Senior standing.
[Fall and Spring]

GBMG 442 International Marketing Management
3 class hours, 3 credits.
An in-depth analysis of the issues involved in developing international marketing programs from the determination of objectives and evaluation of opportunities to the implementation of global strategies. Cases and exercises emphasize how marketing principles are applied and different marketing mixes are developed by multinational providers of goods and services.
Prerequisite: GBMG 345.

GBMG 443 Cross-Cultural Management
3 class hours, 3 credits.
This course considers the challenges of doing business across different national cultures. Topics include identifying cultural differences and their impacts on relationships with customers, suppliers, subordinates, superiors and co-workers. The effect of language, religion, value systems and social structure are considered, as are the implications of differences in attitudes toward performance, uncertainty, assertiveness, individualism, gender, leadership and expectations about the future.
Prerequisite: GBMG 341.
[Spring]

TRANSPORTATION SYSTEMS

GBTT 251 Transportation Systems
3 class hours, 3 credits.
This course presents an overview of the global transportation systems that help integrate our world, including their operation, design, and the economic factors that help drive and influence the supply chains of which they are a part. This course is the first in a sequence of two courses, the other being GBEC 428 Economic Geography, that integrates the presentation and learning of three elements primary to contemporary transportation: 1) system design, organization, and control; 2) global environments and factors, including culture and ethics, that influence transportation processes and activities; and 3) the economics of transportation, including the effects of demand and supply, private sector costing and pricing strategies, and government regulation at all levels.
Prerequisite: GBUS 100.
[Fall and Spring]

GBTT 252 The Business of Shipping
3 class hours, 3 credits.
This course surveys the various aspects of the business of water-borne transport of goods and passengers. Topics include private versus common carriage; organization and management of liner and tramp shipping companies; freight rates; the roles of ship managers, ship brokers; bunker brokers, stevedores, port agencies, terminals and warehouses. These subjects are examined from operational, financial, regulatory and risk- management perspectives.
Prerequisite: GBUS 100.
[Fall and Spring]

GBTT 351 International Logistics
3 class hours, 3 credits.
This course applies a total systems approach to the management of activities involved in the physical movement of raw materials, in-process inventory and finished goods from point of origin to point of use or consumption. Topics include supply chain management, inbound and outbound logistics systems, customer service, inventory and warehousing, transportation management, information systems, global logistics and logistics strategy.
Prerequisite: GBUS 100.
[Fall and Spring]

GBTT 451 Marine Insurance
3 class hours, 3 credits.
An introduction to the fundamentals of cargo, hull, and protection and indemnity insurance. Topics include insurance markets, brokers, agents, underwriters, forms of policies, valuation, total losses, particular average, general average, insured perils, war risks, subrogation, reinsurance and insurance of pollution liabilities.
Prerequisite: GBLW 431.
[Fall and Spring]

GBTT 453 Import/Export and Traffic Management
3 class hours, 3 credits.
A survey of the fundamentals of foreign trade from a transactional perspective. Topics include negotiating the international sales contract, U.S. customs practice, entry of goods, tariffs, foreign trade zones, bonded warehousing, duty drawbacks, export controls, reducing the risk of nonpayment, the letter of credit, letters of undertaking and guarantees, arranging for the transportation of the goods, freight forwarding, non- vessel operating common carriers, negotiating and entering into contracts of affreightment, service contracts, charter parties, bills of lading, insuring the goods, and engaging stevedoring and terminal services.
Prerequisite: GBUS 100.
[Fall and Spring]

GBTT 457 Port and Terminal Operations
3 class hours, 3 credits.
An introduction to the diversified operations within ports, both U.S and international. Topics include the role of port authorities and other governmental agencies, interorganizational relationships, port development, security and law enforcement, traffic control, harbor maintenance, and the operation of container, bulk and petroleum terminals.
Prerequisite: GBUS 100.
[Fall and Spring]

GBTT 460 Principles of Global Supply Chain Security
3 class hours, 3 credits.
The course depicts security as a control mechanism in several major channels in the supply chain; e.g. in human resources confidentiality of employee records; in logistics cargo and passenger security; in communications encrypted email and hacker-free databases; in finance sanctity of credit cards and identity; and in marketing protection of intellectual property. Students will engage in a team research project as a practicum for learning how to develop and conduct vulnerability assessments and security planning. A major underlying course theme is that security can only be successfully developed and implemented in context of the cultural, economic, and political contexts of the supply chain processes for which it serves as a control mechanism. An ASIS endorsed certificate in Global Transportation and Supply Chain Security is issued upon successful completion of this course with a grade of B or better and GBTT 462 and GBTT 465.
Prerequisites: GBUS 100 and Junior standing.
[Fall and Spring]

GBTT 462 Science and Technology Issues of Security
3 class hours, 3 credits.
This course explores the social and political contexts, the implications and consequences of the scientific and technological issues in the security arena. For example, containers now coming out of a port terminal are scanned for radiation; what can the scanners detect and if radiation is detected, what does that mean? How would a city be evacuated in the event a nuclear device was detected? Another example of technology with far-reaching implications is that of biometrics; suppose everybody had their retina patterns in a national database? When is personal information too intrusive for government access? An ASIS endorsed certificate in Global Transportation and Supply Chain Security is issued upon successful completion of this course with a grade of B or better and GBTT 460 and GBTT 465.
Prerequisites: GBUS 100 and Junior standing.
[Fall and Spring]

GBTT 465 Lectures in Contemporary Security Issues
3 class hours, 3 credits.
The capstone course of a minor in intermodal and maritime security jointly offered by the Department of Global Business and Transportation (GBAT), and the Department of Marine Transportation (MT). In addition to lectures by the professor supervising the course, from time to time prominent experts in maritime and intermodal security, from both public and private sectors, will address the students on topical issues of the day in their field of security. Students will be required to do a term paper that integrates the information from the different speakers as well as both primary and secondary research performed by the student. An ASIS endorsed certificate in Global Transportation and Supply Chain Security is issued upon successful completion of this course with a grade of B or better and GBTT 460 and GBTT 462.
Prerequisites: GBUS 100 and Junior standing.
[Fall and Spring]

GENERAL BUSINESS

GBUS 100 Introduction to Business and Economics
3 class hours, 3 credits.
This foundation course introduces students to basic concepts of economics and to the structure, functions, and objectives of the business enterprise.
[Fall and Spring]

GBUS 300 International Business
3 class hours, 3 credits.
An introduction to international business examining the environment in which multinational firms operate and the distinctive ways in which global enterprises perform business functions. Topics include the impact of cultural and political-legal differences, trade theory, regional and global economic integration, foreign exchange, country selection, exporting and importing, supply chain management, marketing globally and international human resource management.
Prerequisite: GBUS 100.
[Fall and Spring]

GBUS 400 Maritime Cyber Security
3 class hours, 3 credits
This course will present the student with the opportunity to gain an understanding of the Maritime Cyber Security environment. It is jointly offered by all of the Departments within SUNY Maritime. In addition to lectures by the professors supervising the course, from time to time prominent experts in maritime and intermodal security, from both public and private sectors, will address the students on topical issues of the day in this critical field of maritime cyber security. Students will be required to do a research paper that integrates the information from the different speakers as well as both primary and secondary research performed by the student.
[Fall and Spring]

GBUS 410 Studies in the African Transportation and Maritime Industry
3 class hours, 3 credits
This course introduces students to the transportation and Maritime industry of the African continent. Students will take a trip to Africa, attend lectures, and participate in research. Topics include studies in the social, historical, cultural, economic, and political environment of the countries visited.
Prerequisite: GBUS 100
[Summer and Winter]

GBUS 525 ITT Internship/Work Experience
6 credits.
Candidates for the Bachelor of Science in International Transportation and Trade are required to perform, with prior approval, an internship in an organization in international transportation, trade or another aspect of global business or to complete a summer study abroad program. The activities are intended to familiarize the ITT candidates with professional work environments and expose them to career opportunities.
Prerequisite: GBUS 100.
[Summer]

GBUS 526 ITT Study Abroad
6 class hours, 6 credits.
This intensive study abroad course is designed to provide undergraduate students with the opportunity to put their academic coursework, theory and concepts learned in the classroom into real time practices as found in the international and global commercial venues. Students in this study abroad program will have the opportunity to discuss critical 21st century topics and issues pertinent to global trade, commerce and transportation with academics, and practitioners in both the public and private sectors in each country visited. Among the issues and topics to be covered include: supply chain management, ports & terminals operations, importing & exporting, intermodal transportation, manufacturing, security, managing risk, fraud and ethics.
Note: This course is to be an alternative to GBUS 525 ITT Internship.
Prerequisites: GBUS 100 and permission of the instructor.
[Summer]

GBUS 610 Special Topics in Business and Transportation
3 credits.
Significant topics in business and transportation are examined that reflect the interest of both the students and the instructor. Activities typically involve review of the current and historical literature on the topic and the design, implementation and presentation of a substantial analytic or developmental project.
Prerequisites: GBMG 341 and permission of the instructor.

GEOLOGY

GEOL 101 General Geology
2 class hours, 2 laboratory hours, 3 credits.
Physical geology, rocks and minerals, plate tectonics, geologic time, evolution of the Earth, processes at Earth's surface, hydrologic cycle, Earth resources.
SUNY-GER: Natural Sciences.
[Fall]

HISTORY

HIST 101 US History to 1865
3 class hours, 3 credits.
A survey of American history from its earliest beginnings to the US Civil War. Course themes focus on developing civic understanding for engaging in the dynamics of the diverse and pluralistic society which comprise the public life of the United States (both past and present).
Corequisite: ENGL 101.
SUNY-GER: US History and Civic Engagement
[Fall and Spring]

HIST 102 US History Since 1865
3 class hours, 3 credits.
A survey of American history from the US Civil War to Present. Course themes focus on developing civic understanding for engaging in the dynamics of the diverse and pluralistic society which comprise the public life of the United States (both past and present).
Corequisite: ENGL 101.
SUNY-GER: US History and Civic Engagement
[Fall and Spring]

HIST 401-402 Topics in European Civilization I-II
3 class hours, 3 credits each.
Survey of European civilization from the Middle Ages to the end of World War II.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 416 U. S. Maritime History to the Civil War
3 class hours, 3 credits.
An investigation into the ways that maritime commerce provided the foundation for the growth of the United States from pre-Columbian times through the Civil War. The focus of the course will be on the growth of America as a sea power, and the influence of the
U. S. Navy and its role in promoting American merchant shipping.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.
[Fall]

HIST 417 U. S. Maritime History since 1865
3 class hours, 3 credits.
An investigation into the major developments in American maritime history from the Civil War to the present. The course will focus on pivotal naval battles, as well as the growth of maritime commerce, as the twin catalysts of national expansion and cultural exchange.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.
[Spring]

HIST 418 History of American Foreign Policy
3 class hours, 3 credits.
A survey of the major developments in American foreign policy.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 421 Vietnam and America
3 class hours, 3 credits.
Vietnam in the Twentieth Century. Focus on America's direct involvement and a consideration of its legacy for the U.S. and for Southeast Asia.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 425 History of Technology
3 class hours, 3 credits.
A survey of selected major developments in Western technology, and their effects on society. Analysis of the process of technological innovation, and the application of modern technology in resource-limited societies. Special emphasis on those developments which bear on modern life and work.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 426 Twentieth Century Technology
3 class hours, 3 credits.
A detailed survey of the major technological developments of the twentieth century. Students will analyze in-depth advances in fields including communication, medicine, transportation, and warfare.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 432 America in the 1950s and 1960s
3 class hours, 3 credits.
A course that explores social, cultural, economic, and political developments from the end of World War II to the resignation of President Nixon in 1974. Significant military aspects of the Cold War and the two Asian conflicts of the period will also be studied, along with their consequences for American society and America's relations with the world.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 436 Sports and American Society
3 class hours, 3 credits.
An examination of the evolution of American society, through the prism of sports. Sports will be utilized as a means to analyze social and economic change, race relations, labor-management conflict and the emergence of player unions, the impact of war on sport, gender issues, and the impact of print and electronic media.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 440 History of American Enterprise I
3 class hours, 3 credits.
This course will explore the lives and critical business decisions of the pioneering entrepreneurs who used the accumulation of capital, acquired through astute investments, to create this nation's largest companies and corporations. Students will examine the role of these business pioneers in the growth of commerce as the engine of cultural exchange and, therefore, American expansion. This course covers the period from the first colonists to 1865.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 441 History of American Enterprise II
3 class hours, 3 credits
This course will explore the lives and critical business decisions of the pioneering entrepreneurs who used the accumulation of capital, acquired through astute investments, to create this nation's largest companies and corporations. Students will examine the role of these business pioneers in the growth of commerce as the engine of cultural exchange and, therefore, American expansion. This course covers the period from the end of the Civil War to the present.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 465 History of Science
3 class hours, 3 credits.
This is a course in the role science played in the development of our modern technologically-based society, and the corresponding role that industrial society has played in the development of contemporary scientific inquiry. The first half of this course will examine major personalities and breakthroughs in the subject matter and processes of science, from the ancient world through the nineteenth century. The second half of the course will focus on selected controversial topics in contemporary science.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.
[Spring]

HIST 471 China and the World I
3 class hours, 3 credits
This survey course covers ancient Chinese history and culture, from pre-history to the mid-19th century, and aims to provide a deeper framework for understanding contemporary China and China's relationship to the world.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 472 China and the World II
3 class hours, 3 credits
This survey course covers Chinese history and culture from the mid-19th century to the present. The course will examine the critical events that shaped modern China and aim to provide a framework for understanding contemporary Chinese politics and China's relationship to the world.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 473 Europe and the World
3 class hours, 3 credits
A survey of Europe's historical transformation through global encounters. Course themes and assignments provide a framework for understanding the foundations of contemporary European society and its political, economic, and cultural relationship with the wider world (from 1492 to present).
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 474 Latin America and the World
3 class hours, 3 credits
A survey of Latin America's historical transformation through global encounters. Course themes and assignments provide a framework for understanding the foundations of contemporary Latin America society and its political, economic, and cultural relationship with the wider world (from Antiquity to present).
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HIST 481 The Holocaust
3 class hours, 3 credits
The course will focus on the complex history of the Holocaust, including lessons for today that we can learn from these events. We will study the history of Nazi Anti-Semitism; the rise of the Nazi party; and the Holocaust, from its beginnings through liberation and the aftermath of the tragedy. We will seek to understand how these "unthinkable" events took place, namely the "Final Solution", Nazi Germany's systematic attempt to exterminate the entire Jewish population. We will learn not only about the suffering of the victims, but also about the actions of the perpetrators, the bystanders, and others who aided and abetted the Nazi Genocide of the Jewish people. We will also study the heroic actions of those who helped save Jews from the horrors of the Holocaust. We will utilize the writings of historians, historical documents, testimonies and writings of survivors, films and other relevant materials.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-29

HUMANITIES

HUMN 201 Early World Civilization & Culture
3 class hours, 3 credits.
An introduction to a broad outline of world culture and the development of civilizations from antiquity through the global early modern era.
Corequisite: ENGL 101
SUNY-GER: World History and Global Awareness
[Fall and Spring]

HUMN 202 Later World Civilization & Culture
3 class hours, 3 credits.
An introduction to a broad outline of world culture and the development of civilizations from the global early modern to the present.
Corequisite: ENGL 101
SUNY-GER: World History and Global Awareness
[Fall and Spring]

HUMN 216 Introduction to Jazz History
This course introduces students to the character, methods, objectives, and cultural significance of jazz music. The course consists of directed listening and viewing of jazz audio and video, textbook and supplemental critical reading, and seminar style discussions of the aesthetic, musicological, socioeconomic, and political implications of jazz as well as the history and development of America's urbane modern musical art form.
Corequisite: ENGL 101
SUNY GER- Diversity, Equity, Inclusion and Social Justice
Previously HUMN 406

HUMN 217 Oceanic Migrations
3 class hours, 3 credits
This course considers literature produced by indigenous peoples around the glob that centers the ocean thematically, theoretically, culturally, and/or historically. Attention is dedicated to topics such as indigeneity, diaspora, globalizations, migration, environmental justice, and (post) colonialism.
Corequisite: ENGL 101
SUNY GER- Diversity, Equity, Inclusion and Social Justice

HUMN 230 Introduction to Philosophy
3 class hours, 3 credits.
An introduction to major schools of philosophical thought. Courses include readings of philosophic works in disciplines including, but not limited to, metaphysics, axiology, ontology, epistemology, and logic.
Corequisite: ENGL 101
SUNY GER- Humanities
Previously HUMN 462

HUMN 232 The Empire Writes Back: De/Post/Colonial Literatures
3 class hours, 3 credits.
How does colonialism affect those who have been colonized, and those who are doing the colonizing? This course studies colonialism, as it is expressed in a variety of literary works: those written from the viewpoint of colonizers, those written from the viewpoint of corresponding colonized peoples, those working to query if literature can be decolonized, etc.
Corequisite: ENGL 101
SUNY GER- Humanities

HUMN 251 Introduction to World Music
3 class hours, 3 credits.
This course introduces students to the character, methods, objectives, and cultural significance of several of the world's music cultures. Class activities include directed listening and viewing of audio and video, textbook and supplemental critical reading, and seminar style discussions of the aesthetic, musicological, socioeconomic, and political implications of world music cultures through various paradigms: sacred/secular, traditional/modern, and work/play.
Corequisite: ENGL 101.
SUNY GER-The Arts.
Previously HUMN 405

HUMN 300 World Literature and Culture III
3 class hours, 3 credits.
A study of the ideas treated in Humanities I & II as they are developed in modern works of fiction and non-fiction.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 391 Digital Humanities Methods
3 class hours, 3 credits.
This course offers students a landscape view of Digital Humanities (DH), focusing on how its various approaches raise new questions, offer fresh approaches to old questions, and embody new epistemologies. Students will gain an understanding of the emerging role of DH across several academic disciplines and begin to learn some of the fundamental skills often used in DH projects and work. Though no previous technical skills are required, students will be asked to experiment in introductory ways with DH tools and methods.
Prerequisite: ENGL 101

HUMN 392 GIS/Mapping in the Humanities
3 class hours, 3 credits
This course offers an introduction to the wide range of applications of Geographic Information Systems (GIS) mapping in the humanities and social sciences, as well as to the use of various mapping tools, with a sustained focus on training in ArcGIS.
Prerequisite: ENGL 101
[Fall]

HUMN 400 History of Art
3 class hours, 3 credits.
A study of painting, sculpture, and architecture from prehistoric times to the present. Fundamental concepts of art analysis will also be introduced.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 401 Studio Drawing and Painting
3 class hours, 1 studio hour, 3 credits.
Two class hours a week introduce basic techniques of drawing and painting, two classes weekly of lecture and discussion on the visual elements and major styles in art history. No previous art experience is necessary.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 402 Images of Men, Women, and Machines
3 class hours, 3 credits.
Looking at art, film, fiction, drama, advertising, and photography over the past hundred years, this course focuses on the social and cultural impact of modern machines, and the ways these machines including automobiles, airplanes, home appliances, and consumer electronics have transformed the lives of both men and women.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 403 A History of Western Music
3 class hours, 3 credits or 2 class hours, 2 rehearsal/performance hours, 3 credits.
A historical survey of Western music from the medieval to the present, emphasis on stylistic characteristics and representative composers and works. Students who will complete two years of satisfactory service in the College band before graduation need attend only two class hours each week. Others will attend a third class hour or work on an appropriate project.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 404 Art and Technology
3 class hours, 3 credits.
An introduction to the interrelationships between art, technology, science and engineering.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 430 Case Studies in Constitutional Law
3 class hours, 3 credits.
This course will examine the role of the Supreme Court in the American system of government, focusing on particular cases and legal principles in depth. Students will read Constitutional Law cases and other materials and will prepare oral presentations and written materials analyzing cases and legal principles.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.
[Spring]

HUMN 454 The Words and Images of War
3 class hours, 3 credits.
An in-depth investigation of the experience of war from ancient times until today through the stories, novels and poems of combatants, complemented by fiction and non-fiction films and photographic essays. These readings are underscored by theoretical studies of human aggression, violence and killing.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 460 The Bible as/in Literature
3 class hours, 3 credits.
Discussion of literary dimensions of passages from the Bible and the relationships of a variety of other stories, poems, and plays to the Bible.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 461 Religion
3 class hours, 3 credits.
An introduction to the philosophy of religion. Principal topics of discussion include immortality; the problem of evil; and the principle of inerrant scripture.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 465 Humanities Research Methods
3 class hours, 3 credits.
An elective for students seeking to enhance their skills in research, analysis, and writing. This course is aimed at introducing the student to the skills involved in historical, literary, or aesthetic research. Emphasis is on the ability to locate, evaluate, and synthesize data, as well as the technical aspects of academic investigation, research methods and tools, and expository writing.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.
[Fall - Odd Years]

HUMN 467 Science Fiction
3 class hours, 3 credits.
In this class we will critically examine a broad range of genre literature on themes such as race, religion, ecological peril, artificial intelligence, exploration, and colonization. Students will consider these concepts in light of historical context and theoretical concepts (such as symbolist/allegorical texts, simulacra, ergodicity, and the hermeneutic/proairetic code) and complete a significant work of independent research in which they link fiction with real-world application.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 490 Studies in Maritime Policy
3 class hours, 3 credits.
Analysis of the technological, legal, environmental, and ethical aspects of policy decisions in the maritime sphere. Readings range from polemical arguments by interest groups to international treaties. Students prepare case studies and argue positions as both advocates and arbiters.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.
[Spring]

HUMN 505/515 Internship in Maritime Studies I/II
3 credits each term.
Student placement in maritime-related publishing, marketing, legal, and museum sites. Students will devote six hours per week (typically one full day) to their internship, keep a journal of activities, and file an end-of-term report with their faculty mentor.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

HUMN 601-602 Independent Studies in the Humanities I-II
1, 2, or 3 credits each.
Independent investigation of special topics in Humanities. Student work will be under the direct supervision of a mentor approved by the Humanities Department.
Prerequisite: Permission of the department chair.

HUMN 610-611 Special Topics in Humanities I-II
3 class hours, 3 credits each.
Special topics and issues for qualified students interested in acquiring a broader knowledge of our linguistic, literary, or artistic heritage.
Prerequisite: ENGL 101 and 9 credits in ENGL, HIST, or HUMN 100-299.

LEADERSHIP

LEAD 101 Leadership and the Maritime Experience
1 class hour, 1 credit.
A required course for all freshmen (first-time college or < 32 transfer credits). This course is aimed at introducing the student to college life with emphasis on the unique history and goals of Maritime College, helping the student manage the difficult transitional first year of college via the formulation of a plan for academic success, and fostering the student's potential for leadership via the development of self-awareness and interaction with other students from diverse backgrounds.
[Fall and Spring]

LEAD 102 Springboard to Regimental Success
1 class hour, 2 training hours, 0 credits.
This course is designed to introduce the student to the rigors and responsibilities of the Regiment of Cadets at SUNY Maritime. The course utilizes a unique and engaging format of classroom meetings, physical training, and regimental activities to promote personal and academic skills that will assist the student in navigating the collegiate experience and the U.S.C.G. license program. Upon successful completion of the course, students will be ensured a training billet in the following summer's INDOC program. Course is graded Pass/Fail.
Prerequisite: Acceptance to J-Start program.
[Spring]

LEAD 201 Exploring Leadership
1 class hour, 1 credit.
This integrative course offers students an opportunity to connect the study of leadership theory with opportunities to practice leadership. Students will explore the concept and practice of "citizen leadership" as a framework for civic and professional leadership roles throughout life. LEAD 201 introduces "leadership" and "citizenship" as social constructs, i.e., ideas and values that vary across cultural and historical contexts.
Prerequisite: LEAD 101.

LEAD 401 Leadership Seminar
1 class hour, 1 credit.
The course is designed to be a blended nontraditional seminar class focused as a culminating leadership experience. Considerable introspection and exploration of your time both at Maritime College and within the SAIL Program is expected. The underlying theme is that every person can become a leader and that the ability to lead begins with the process of self-discovery (LEAD 101) and ends with self-actualization (LEAD 401). LEAD 401 has an experiential component where students are expected to assess past and present leadership experiences to identify their leadership style.
Prerequisite: LEAD 201.

MATHEMATICS

The Science Department administers a placement test in mathematics to all undergraduate students admitted to the college. An evaluation of each student's mathematics preparation will be based on the performance on this test and admissions credentials. First-semester students, including transfer students, will be registered in the appropriate mathematics course in accordance with the results of this evaluation and their choice of curriculum. All incoming Bachelor of Engineering students will be scheduled for MATH 101 (or higher if awarded transfer credit). A weekly 75-minute recitation aimed at students who need supplementary work in college algebra and trigonometry is available. Incoming students identified by the math placement exam as needing such additional preparation will be required to attend the recitation.

MATH 080 Elementary Algebra
3 class hours, 3 credits.
Arithmetic review; scientific notation; algebraic operations; factoring; solving linear and quadratic relations; absolute value; Pythagorean theorem; coordinate geometry; graphing lines and parabolas; relevant word problems. Course offered on a pass/fail basis. This course may not be used to satisfy any degree requirement.
[Fall and Spring]

MATH 090 Introduction to College Mathematics
4 class hours, 4 credits.
Algebra review; basic function concepts; lines, systems of linear equations, and linear functions; quadratic functions; polynomial and rational functions; exponential functions and logarithms; trigonometry and trigonometric functions; applications to problems in business and the sciences. A weekly 75-minute recitation aimed at students who need supplementary work in college algebra and trigonometry is available. Incoming students identified by the math placement exam as needing such additional preparation will be required to attend the recitation.
Prerequisite: MATH 080.
SUNY-GER: Mathematics.
[Fall and Spring]

MATH 101 Calculus I
4 class hours, 4 credits.
A first course in the calculus of one-variable functions with emphasis on preparing students for Bachelor of Engineering majors. Topics include: the limit of a function; continuity and differentiability; average and instantaneous rates of change; differentiation of algebraic, trigonometric, exponential, and inverse functions; algebraic and geometric interpretation of a function and its derivatives; optimization; related rate applications; and an introduction to antidifferentiation including the definite integral. All incoming Bachelor of Engineering students will be scheduled for MATH 101 (or higher if awarded transfer credit). A weekly 75-minute recitation aimed at students who need supplementary work in college algebra and trigonometry is available. Incoming students identified by the math placement exam as needing such additional preparation, and students who received below B- in MATH 90 will be required to attend the recitation. Credit will not be given for both this course and MATH 111.
Prerequisite: A grade of C- or better in MATH 090.
SUNY-GER: Mathematics.
[Fall and Spring]

MATH 102 Calculus II
4 class hours, 4 credits.
A second course in the calculus of one-variable functions with emphasis on preparing students for bachelor of engineering majors. Topics include: Antiderivatives; the definite integral; Fundamental Theorem of Calculus; techniques of integration; l'Hôpital's rule; improper integrals; geometric applications of integration; numerical sequences and series; power series; Taylor polynomials and Taylor series.
Prerequisite: A grade of C- or better in MATH 101.
SUNY-GER: Mathematics.
[Fall and Spring]

MATH 111 Applied Calculus I
4 class hours, 4 credits.
A first course in the calculus of one-variable functions with applications to business and science. Topics include: The limit of a function; continuity and differentiability; average and instantaneous rates of change; differentiation of algebraic, exponential, and logarithmic functions; algebraic and geometric interpretation of a function and its derivatives; optimization; related rate applications; and an introduction to antidifferentiation including the definite integral. Credit will not be given for both this course and MATH 101.
Prerequisite: MATH 090.
SUNY-GER: Mathematics.
[Fall and Spring]

MATH 112 Applied Calculus II
3 class hours, 3 credits.
A survey of calculus topics beyond the differentiation of one-variable functions, with emphasis on applications of interest to Marine Environmental Science and Marine Operations majors. Topics include: Integration and the Fundamental Theorem of Calculus; multidimensional structures, including vectors, complex numbers, and matrices; differentiation, and integration of functions of several variables; introduction to ordinary differential equations.
Prerequisite: MATH 101 or MATH 111.
SUNY-GER: Mathematics.
[Spring]

MATH 211 Calculus III
4 class hours, 4 credits.
A first course in multivariable calculus. Topics include: Multidimensional structures, including vectors, complex numbers, and matrices; geometry of lines and planes; the calculus of vector-valued functions and its applications; differentiation and optimization of functions of several variables; double and triple integrals; polar, cylindrical, and spherical coordinate systems; vector fields; line and surface integrals, including use of Green's Theorem.
Prerequisite: MATH 102.
[Fall and Spring]

MATH 212 Differential Equations
4 hours, 4 credits.
First order equations and applications; linear differential equations of higher order; applications of 2^{nd} order linear differential equations; power series solutions; Laplace transforms; systems of linear equations; elements of linear algebra, matrices and determinants; Fourier series; solutions of partial differential equations by the method of separation of variables.
Prerequisite: MATH 211.
[Fall and Spring]

MATH 213 Discrete Mathematics

3 class hours, 3 credits.

This course lays the groundwork for further courses in discrete mathematics and theoretical computer science. Topics include sets, functions, relations, formal logic (propositional and predicate calculus); elementary number theory.

Prerequisite: MATH 101

[Fall]

MATH 251 Statistics

3 class hours, 3 credits.

An introductory course in statistical methods. Topics include: frequency distributions; measures of central tendency, variability, and relative standing; normal and binomial probability distributions; confidence intervals and hypothesis testing for mean and proportion; one-way analysis of variance and contingency tables; bivariate and multiple regression analysis; with use of calculators and Excel to describe and analyze data. Credit will not be given for both this course and ENGR 345.

Prerequisite: MATH 090. SUNY-GER: Mathematics. *[Fall and Spring]*

MATH 311 Linear Algebra

3 class hours, 3 credits.

A first course in linear algebra. Topics include: linear systems; echelon forms; matrix algebra; spaces of vectors, linear independence and bases; linear transformations; orthogonality; determinants; eigenvalues and eigenvectors; diagonalization; and an introduction to abstract vector spaces. Applications to engineering will appear throughout the course.

Prerequisite: MATH 211.

MATH 446 Operations Research

3 class hours, 3 credits.

Quantitative methods for business-oriented decision and optimization problems. Topics chosen from among: linear programming and related sensitivity analysis; transportation problem; network and project-scheduling algorithms; queues; simulation; Markov processes; decision analysis. Use of software packages.

Prerequisite: ENGR 345 or MATH 251.

[Fall and Spring]

MATH 610 Special Topics in Mathematics

1, 2, or 3 credits.

METEOROLOGY

METE 201 Meteorology for Mariners
2 class hours, 2 laboratory hours, 3 credits.
Structure and composition of the atmosphere; atmospheric radiation; forces and winds; general circulation; moisture; atmospheric stability; polar front and wave cyclone theory; marine weather observations; elements of weather forecasting and ship routing. In compliance with international STCW requirements, there will be no D or D+ grades in this course.
SUNY-GER: Natural Sciences.
[Fall and Spring]

METE 350 Synoptic Meteorology
3 class hours, 2 laboratory hours, 4 credits.
Surface and upper-air circulation systems, vorticity and divergence, thickness and hydrostatics, air masses and fronts, moisture and stability, theory of weather forecasting. Plotting and analysis of surface and upper-air charts, use of thermodynamic diagrams, dynamic and non-dynamic forecast techniques, scales of motion, weather analysis and forecasting using NMC charts operationally available.
Prerequisite: METE 201.
[Fall - Odd Years]

METE 402 Tropical Cyclones
2 class hours, 2 laboratory hours, 3 credits
Tropical circulation; stream function and analysis; trade wind features; the ITCZ; tropical disturbances; easterly waves; tropical vortices; the monsoon; the hurricane problem; man and the hurricane; damage; recent research.
Prerequisite: METE 201.

METE 408 Dynamic Meteorology
3 class hours, 3 credits.
Thermodynamics of gases and applications to meteorology; atmospheric hydrostatics and thickness; thermodynamics of water vapor and moist air; elements of cloud physics. Hydrodynamics of fluids and applications to meteorology; The Equation of Motion; continuity; divergence and vertical motion; The Vorticity Equation; elements of quasi- geostrophic theory
Prerequisites:MATH 111 or 101, METE 201, PHYS 211.
[Spring - Even Years]

METE 411 Marine Climatology
2 class hours, 2 laboratory hours, 3 credits.
History of modern climatology; temperature & moisture controls; planetary winds & ocean currents; local winds; monsoonal weather, El Nino & La Nina; tropical climates; mid-latitude climates; polar climates; climatic change & global warming, fog & sea ice; acid rain & ozone depletion; climatic impact of extreme atmospheric events.
Prerequisite: METE 201.

METE 422 Weather Forecasting
2 class hours, 2 laboratory hours, 3 credits.
Quasi-geostrophic forecast theory, elements of numerical weather prediction; short range forecasting and nowcasting; operational forecasting using NMC charts, radar, and satellite pictures.
Prerequisite: METE 201.

METE 610 Special Topics in Meteorology
3 class hours, 3 credits.
Theoretical and/or experimental investigation of contemporary topics or problems in meteorology.
Prerequisite: As specified by the department chair.

MARINE TRANSPORTATION

MT 212 Ship Management
2 class hours, 3 credits.
The student will learn fundamental concepts and principles required to manage an international shipping company from the shoreside perspective. Subjects will include the various types of charter agreements, voyage trading data, cargo booking and trading, Bills of Lading, Insurance and the customer/owner relationship.
[Fall and Spring]

MT 250 Ship Construction and Stability for Unlimited License
2 class hours, 2 credits.
Description of structural components, types of construction, materials and methods of shipbuilding. Principles of ship form, flotation, transverse and longitudinal stability. Application of stability, trim, and stress tables, and stress calculating equipment and software. Merchant marine methodology in stability and trim calculations for intact and damaged vessels. This course satisfies STCW requirements in the areas of ships construction and stability. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Corequisites: MATH 090.
[Fall and Spring]

MT 321 Introduction to Cargo Operations and Ship Stability
3 class hours, 3 credits.
The course is in two sections. The first section is a review of basic ship's construction; structural components, types of construction, materials and methods of shipbuilding. This section will also study the principles of transverse and longitudinal stability, general stability and trim calculations for both intact and damaged vessels as appropriate to the licensed deck officer. The second section of the course focuses on a study of vessel cargo and the role of the ship in integrated transportation systems. Specific topics include a survey of cargo gear, principles and problems of stowage and carriage of general, bulk, refrigerated, dangerous cargo, grain, special cargoes and containers, and the role of the ship's officer related to various types of vessels and cargo operations. A complete project is required dealing with the actual loading and stowage of a vessel, utilizing industry soft- ware and actual ship specifications. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MATH 090, ENGR 363 or ENGR 371 or MT 250.
[Fall and Spring]

MT 322 Marine Cargo Operations
2 class hours, 2 laboratory hours, 3 credits.
A study of the tanker industry, and the operational aspects of the tanker; including basic safety and pollution prevention precautions and procedures, layouts of different types of oil tankers, types of cargo, their hazards and their handling equipment, general operations sequence and oil tanker construction and terminology. Pertinent U.S. Coast Guard and OPA '90 regulations will be covered, as well as how they relate to specific duties and responsibilities. Operational exposure to loading/discharging and auxiliary tanker systems will be gained through exercises structured around the school's tanker in a weekly two- hour laboratory. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MT 250 or MT 321, ENGR 510 or MT 510.
[Fall and Spring]

MT 350 Hazardous Materials and Oil Spill Response
3 class hours, 3 credits.
This course will introduce the student to current methods and strategies used to combat oil and hazardous materials spills. The course will review legislation pertaining to facility and vessel response plans, carriage of hazardous materials, and worker safety. The course will familiarize the student with various types of spill response equipment and strategies through both classroom lectures and practical demonstrations.
[Spring]

MT 404 Environmental Management
3 class hours, 3 credits.
This class will provide an overview of current international environmental regulations as they pertain to the shipping industry. The discussion will include the place of environmental compliance in the company and the compliance process. Sections of the following Laws pertaining specifically to Vessel Operations will be used: MARPOL, Resource Conservation and Recovery Act, Clean Water Act, Clean Air Act, Montreal Protocol, State Statutes. Public health statutes applicable to shipping and vessel sanitation will also be covered. (USPHS – CDC Reporting Criteria). Case studies will be used throughout the course.
[Fall and Spring]

MT 408 International Safety Management
3 class hours, 3 credits.
This course will introduce students to the ship management requirements found in the IMO's International Safety Management Code and how those requirements and principles are applied in the international shipping industry. Students will become familiar with the various aspects of the code and how the Code is implemented through such programs as safety management programs. Extensive use of case studies will be made.
[Fall and Spring]

MT 412 Deck License Seminar
8 class hours, 4 credits.
Lecture, discussions and problems dealing with subjects required by the U.S. Coast Guard for federal license as an officer in the merchant marine. In order to complete this course satisfactorily each candidate for license is required to demonstrate, by qualifying examinations in all areas, his ability to become a fully qualified merchant marine officer. Topic areas include: Chart Plot, Oceans, Navigation Problems, Rules of the Road, Deck General, Deck Safety, Navigation General. Examinations are administered to replicate conditions under which Federal exams are given. Students must pass this course before they will be allowed to sit for the Coast Guard license. Course is graded Pass/Fail.
Prerequisites: MT 322, MT 520 or MT 521, NAVG 312, NAUT 308, NAUT 314, NAUT 315.
[Fall and Spring]

MT 426 Maritime Communications
2 class hours, 2 laboratory hours, 3 credits.
A Simulator-based training course designed to satisfy the International Maritime Organization (IMO) requirements for training in Global Maritime Distress and Safety Systems. The course provides the student with a good working knowledge of modern marine communications. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MT 510.
[Fall and Spring]

MT 430 Principles of Emergency Management Systems
3 class hours, 3 credits.
This course uses established guidelines set by FEMA and widely used in business to introduce students to the emergency management system in theory and practice. Discussion will include general topics in emergency management systems with an emphasis on how corporations are including these principles into business continuity planning. The course will include such topics as risk analysis, communications, planning and mitigation.
[Fall and Spring]

MT 435 Maritime Security
3 class hours, 3 credits.
Perform Federal Level 1 Anti-Terrorism Training. Instruct in Chemical, Biological and Radiological Defense (CBR-D). Obtain certification as a Vessel, Company and Facility Security Officer. Instruction and discussion on current security issues and technology. The purpose of this course is to provide the student with a fundamental knowledge in Maritime Security and prepare them to be a Vessel, Company or Facility Security Officer. In compliance with international STCW requirements, there will be no D or D+ grades in this course.
[Fall and Spring]

MT 450 Liquefied Gas Tanker Operations
2 class hours, 2 laboratory hours, 3 credits.
The purpose of this course is to meet the training requirements for Liquefied Gas Vessel Person in Charge. The 42 hour course provides individuals with a thorough working knowledge of liquid gas tank ship operations and enables them to conduct safe, pollution free cargo operations. The emphasis of the course is placed on safety and operational aspects of cargo operations in accordance with accepted industry practice and legal requirements. This course covers the mandatory minimum training requirements of a Liquefied Gas Tanker Training Program as listed in Section A-V/1 paragraph 22-34 in the STCW 95 Code and 46 CFR Part 13 Table 13.121(F). In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MTO 112, MT 250, MT 322.

SUMMER SEA TERM (DECK)

MT 510 Ship Operation and Management I (Summer Sea Term I)
6 credits.
Communications: Visual communications used in the merchant marine; Morse Code, blinker light and International Code Flags; merchant ship communications systems; use of lifeboat radio apparatus.
Navigation: Use of shipboard aids available to the navigator; elementary chart work plotting position, courses and distances; practical supervised piloting; introduction to instruments used in celestial navigation.
Operations: Ship activation; boat handling; davit operation; man-overboard drills; hull construction; numbering of compartments, deck doors, firehouse stations and extinguishers; ventilation; drainage; fire and flushing mains; loading marking; deck fittings; preservation, sanitation and maintenance; safety practices; ship deactivation, Basic Rules of Nautical Road. In compliance with international STCW requirements, there will be no D or D+ grades in this course. This course also includes required STCW training for Vessel Personnel with Designated Security Duties (VPDSD). Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: NAUT 102, NAVG 112, MTO 103, MTO 112. Students must satisfactorily complete Vessel Personnel with Designated Security Duties (VPDSD) training at SUNY Maritime College and Mug Ship Weekend in order to be eligible to take MT 510.
[Summer]

MT 520 Ship Operation and Management II, Intermediate (Summer Sea Term II)
6 credits.
Communications: Ship's visual communication apparatus; signal practice to obtain a speed of eight words per minute with the blinker light: International code, H.O. 102. Introduction to radio telephone.
Navigation: Sextant-review of adjustments and altitude measurements; celestial observations; computing and plotting of lines of position; azimuths and compass error; practical adjustments of the magnetic compass; chart work in conjunction with all phases of piloting and sailing; correction of charts and publications from Notices to mariners. Introduction to electronic aids to navigation. Day's work.
Operations: Care of lifeboats and equipment; fire detection and extinguishing systems; use of portable fire extinguishers, emergency lifesaving appliances, cargo booms and winches, grand tackle, line throwing apparatus; tours of foreign port facilities, ships and shipyards. Intermediate Rules of Nautical Road.
Meteorology: Plotting and making the weather map; synoptic observations and weather forecasting at sea.
In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MT 510, METE 201, NAVG 212.
[Summer]

MT 521 Cadet Commercial Vessel Shipping (in lieu of Summer Sea Term II)
6 Credits.
Cadets with exceptional academic status may, upon application to the Department of Marine Transportation, be selected to sail on a commercial ship in lieu of Summer Sea Term II. Cadets will be assigned to vessels exceeding tonnage specified by the U.S. Coast Guard for Unlimited Tonnage, Any Ocean Qualification for a minimum of sea days approved by the Marine Transportation Department. Candidates are selected by the Department of Marine Transportation, based upon academic and regimental performance. An extensive sea project is required. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MT 510, METE 201, NAVG 212.
[Fall, Spring and Summer]

MT 530 Ship Operation and Management III, Advanced (Summer Sea Term III)
5 credits.
Communications: Review of visual signaling and practical work to obtain a speed of six words per minute in blinker; radio auto-alarm; VHF/UHF radiotelephone operations; GMDSS Operators Certificate.
Navigation: Practical work in celestial navigation, electronic navigation, relative motion and piloting; analysis of dead-reckoning, running fixes and estimated positions supervising the correction of charts and publications; practical use of the tide and tidal current tables; duties and responsibilities of the navigator.
Operations: Steering gear drill, individual ship handling, use of distress signals, preparation of ship for U.S. Coast Guard annual inspection; foreign ports and port facilities; assumption of deck officer's duties and responsibilities. Advanced Rules of the Road. Each cadet on his/her first class Sea Term must take and pass the written qualifying examination. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: NAUT 308, NAVG 312, satisfy Ship Work and Training requirements.
Corequisite: MTO 412.
[Summer]

MT 533 Ship Operation and Management III for International Students
5 credits.
This is a 45 day training term at sea. This course is only for international students to enable completion of their sea time requirements.
Prerequisite: MT 520 or MT 521.
[Summer]

MT 601-602 Independent Study in Marine Transportation I-II
1, 2, 3, or 4 credits each.
Independent investigation of special topics in Marine Transportation. Student work will be under the direct supervision of a mentor assigned by the Marine Transportation Department. In the event that the course earns 1 credit, the department has the option of assigning a Pass/Fail grade.
Prerequisite: Permission of the department.

MT 610-611 Special Topics in Marine Transportation I-II
3 credits each.
Significant/varied topics in marine transportation of specialized interest are covered. Topics will be chosen to reflect the interest of both students and instructor.
Prerequisite: All required MT courses.

MARITIME TECHNOLOGY AND OPERATIONS

MTO 103 Water Safety and Survival for Mariners
2 class hours, 1 credit
A water safety and survival course that includes swimming, stroke development, conditioning, fitness and wellness. This course includes all required USCG STCW practical assessments and is a required course for students in any of the USCG licensing programs. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
[Fall and Spring]
Previously PS 103.

MTO 112 STCW Basic Training
1 class hour, 2 laboratory hours, 2 credits
Successful completion of this course and MTO 103 satisfies the four elements of STCW Basic Training requirements for all shipboard personnel. Elements include Personal Survival Techniques, Fire Prevention and Fire Fighting, Elementary First Aid, and Personal Safety and Social Responsibility training requirements. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
[Fall and Spring]
Previously PS 112.

MTO 120 Primer of Towing
1.5 class hours, 2.5 laboratory hours, 3 credits.
This hands-on course is designed to examine vessel and external characteristics impacting towing vessels. Lectures analyze the science of forces to include controllable (engine, rudders, etc.), Semi-Controllable (bank cushion, bank suction, interaction, and shallow water effect) Uncontrollable (wind and current), and external towing forces. Practicums initiate classroom lecture concepts for students to appraise and predict basic piloting and maneuvering concepts on a single-screw displacement hull advancing to the colleges Tug and Barge Simulator to compare/contrast advanced twin-screw and azimuth-drive maneuvering systems. Various towing applications and forces are defined and appraised by means of simulation. Topics covered use a variety of techniques with an emphasis on hands-on, practical application of all skills.
[Fall]
Previously PS 120.

MTO 200 Introduction of Regulatory Framework
3 class hours, 3 credits.
The course examines the basic regulatory frameworks and interrelationships and vocabulary of International and Domestic Rules, Regulations, and Conventions. It also focuses on developing an understanding and appreciation of Domestic regulatory framework process and external influences including Government, Organizations, Associations, and citizen groups. The course is designed to help the student understand the topics and regulations he/she will utilize in greater detail in future careers.
Previously MTO 300.

MTO 211 Advanced Towing Operations
1 ½ class hours, 2 ½ practicum hours, 3 credits.
A course to expand upon towing force principles to identify, formulate, and appraise complex advanced towing operations through simulation of towing and docking operations, push-gear, alongside towing, astern towing, ship docking, and barge docking. The course strengthens and enhances MTO 120 learning outcomes of tug and towboat evolutions The course is designed to help the student understand towing applications he/she will utilize in greater detail in maritime transportation systems.
Prerequisite: MTO 120.
[Fall]
Previously MTO 411.

MTO 212 The Business of Towing
1.5 class hours, 2 weekend internships, 3 credits.
The course examines the basic concepts of tug and towboat definitions, construction and design; deck seamanship; vessel and managerial operations; and communications. The course is designed to help the student understand the topics and regulations he/she will utilize in greater detail in Towing Operations. A report on the internship related to the towing industry is required.
Prerequisite: MT 510 or ENGR 510.
[Spring]
Previously MTO 410.

MTO 310 Shipyard Management
3 class hours, 3 credits.
This course introduces the concepts of shipyard management, and highlights the shipbuilding and ship repair process. This course applies principles of project management focusing on the importance of owner/customer activity, and surveys the forces, factors and risks associated with shipbuilding in shaping successful outcomes.

MTO 412 Medical First Aid
2 class hours, 1 credit.
The course is based on the IMO model course for Medical First Aid. It includes: study and practice in: the contents of a standard first aid kit, the anatomy and physiology of human body systems, toxicological shipboard hazards, identification of hazardous substances and hazards of exposure, patient assessment, standard isolation techniques, CPR and use of AED, treatment of burns and scalds, heat and cold emergencies, symptoms and treatment of hyperthermia/ hypothermia/ dehydration, radio medical services, medications, sterilization techniques, prevention of disease transmission, treatment for shock, broken bones, dislocations, splinting, and patient movement and transportation. This course meets STCW requirements as set forth in Table A-VI/4-1 and is approved by the U.S. Coast Guard to meet the First Aid and CPR requirements in 46 CFR 11.201(i), if taken within one year of graduation. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
[Spring and Summer]
Previously PS 412

MARITIME TECHNOLOGY AND OPERATIONS DECK OFFICER

MTOD 414 Bridge Resource and Team Management
1 class hour, 3 simulator hours, 3 credits.
This simulator-based course is designed to enhance the potential Officer in Charge of a Navigation Watch (OICNW) decision- making skills as it applies to traffic and voyage planning situations. Practical application of Rules of the Road and development of correct bridge procedures will be emphasized. Open sea and harbor conditions will be simulated for day as well as night using the simulator. Each watch team has 3 simulator hours and 1 class hour per week. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MATH 090, NAUT 314, NAUT 315, MT 520 or MT 521 or MTOD 524.
[Spring]
Previously MTDO 414 Bridge Resource Management (Limited License)

MTOD 524 Cadet Commercial Vessel Shipping I
2 credits.
Introduction to the workboat industry internship. Successful completion of the course includes a minimum number of sea days approved by the MTO Department Chair on a vessel assignment arranged by Maritime College's Cadet Shipping Coordinator and submission of a satisfactory sea project, assigned by the MTO Department Chair or designee. Cadet Sea Service from Indoctrination to program completion must be properly documented and meet the Maritime College U.S. Coast Guard program approval. Cadets must submit sea service documentation to the Director of Licensing and Cadet Shipping in a timely manner. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MT 510.
[Summer]
Previously MTDO 524

MTOD 525 Cadet Commercial Vessel Shipping II
4 credits.
Workboat industry internship that includes an emphasis on Cargo and Stability. Successful completion of the course includes a minimum number of sea days approved by the MTO Department Chair on a vessel assignment arranged by Maritime College's Cadet Shipping Coordinator and submission of a satisfactory sea project assigned by the MTO Department Chair or designee. Cadet Sea Service from Indoctrination to program completion must be properly documented and meet Maritime College's U.S. Coast Guard program approval. Cadets must submit sea service documentation to the Director of Licensing and Cadet Shipping in a timely manner as follows: sea service letters and Tankerman Person-in-Charge (PIC) documentation in compliance with 46 CFR §13.303 In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: METE 201, MT 321, MT 322, MTO 410 or MTO 411, MTOD 524, NAUT 308.
[Summer]
Previously MTDO 525

MTOD 526 Cadet Commercial Vessel Shipping Limited Tonnage III
2 credits.
Workboat industry internship that includes an emphasis on Navigation, Leadership and Team-working Skills, and Management Systems. Successful completion of the course includes a minimum number of sea days approved by the MTO Department Chair on a vessel assignment arranged by Maritime College's Cadet Shipping Coordinator and submission of a satisfactory sea project assigned by the MTO Department Chair or designee. Cadet Sea Service from Indoctrination to program completion must be properly documented and meet Maritime College's U.S. Coast Guard program approval. Cadets must submit sea service documentation to the Director of Licensing and Cadet Shipping in a timely manner. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MTO 410 or 411, MTOD 414, MTOD 524, NAUT 308, NAVG 212 for Ocean option, NAVG 312.
[Summer]
Previously MTDO 526

MTOD 601 Independent Study in Marine Technology Small Vessel Operations I
1, 2, 3, or 4 credits.
Independent investigation of special topics in the field of Marine Technology Small Vessel Operations. Cadets will be assigned a mentor by the Professional, Education, and Training Department. In the event that the course earns 1 credit, the department has the option of assigning a Pass/Fail grade.
Prerequisite: Permission of the department.
Previously MTDO 601

MTOD 602 Independent Study in Marine Technology Small Vessel Operations II
1, 2, 3, or 4 credits.
Independent investigation of special topics in the field of Marine Technology Small Vessel Operations. Cadets will be assigned a mentor by the Professional, Education, and Training Department. In the event that the course earns 1 credit, the department has the option of assigning a Pass/Fail grade.
Prerequisites: MTOD 601 and Permission of the department.
Previously MTDO 602

MARITIME TECHNOLOGY AND OPERATIONS ENGINE OFFICER

MTOE 521 Cadet Commercial Vessel Shipping Assistant Engineer I
2 credits.
Successful completion of the course includes a minimum number of sea days approved by the MTO Department Chair on a vessel assignment arranged by Maritime College's Cadet Shipping Coordinator and submission of a satisfactory sea-project assigned by the MTO Department Chair or designee. Cadet Sea Service from Indoctrination to program completion must be properly documented and meet Maritime College's U.S. Coast Guard program approval. Cadets must submit sea service documentation to the Director of Licensing and Cadet Shipping in a timely manner. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: ENGR 510.
[Summer]
Previously MTEO 521

MTOE 522 Cadet Commercial Vessel Shipping Assistant Engineer II
4 credits.
Successful completion of the course includes a minimum number of sea days approved by the MTO Department Chair on a vessel assignment arranged by Maritime College's Cadet Shipping Coordinator and submission of a satisfactory sea project assigned by the MTO Department Chair or designee. Cadet Sea Service from Indoctrination to program completion must be properly documented and meet the academy's U.S. Coast Guard program approval. Cadets must submit sea service documentation to the Director of Licensing and Cadet Shipping in a timely manner. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MTOE 521, MTOE 561.
[Summer]
Previously MTEO 522

MTOE 523 Cadet Commercial Vessel Shipping Assistant Engineer III
2 credits.
Successful completion of the course includes a minimum number of sea days approved by the MTO Department Chair on a vessel assignment arranged by Maritime College's Cadet Shipping Coordinator and submission of a satisfactory sea project assigned by the MTO Department Chair or designee. Cadet Sea Service from Indoctrination to program completion must be properly documented and meet the academy's U.S. Coast Guard program approval. Cadets must submit sea service documentation to the Director of Licensing and Cadet Shipping in a timely manner as follows: sea service letters and Tankerman Person-in-Charge (PIC) documentation in compliance with 46 CFR §13.303. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: MT 250, MT 322, MTOE 201.
[Summer]
Previously MTEO 523

MTOE 561 Marine Engines and Auxiliary Machinery I
2 class hours, 2 laboratory hours, 3 credits.
Small Vessel Engineer I will be an STCW course that is the first in a two semester sequence in the comprehensive study of numerous designs and features of high- and medium-speed diesel engines including aspects of operation, maintenance and repair. Topics include: Main and auxiliary engines, propulsion and drive systems, lubrication systems, bearings, starting systems, fuel and combustion systems, intake and exhaust systems, cooling and charge-air systems, and casualty control methods. Laboratory hours consist of operation, maintenance, repair and management of the campus diesel fleet (minimum 6 hrs/week} and a journal kept. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: ENGR 510.
[Fall]
Previously MTEO 561 Small Vessel Engineer I

MTOE 562 Marine Engines and Auxiliary Machinery II
2 class hours, 2 laboratory hours, 3 credits.
Small Vessel Engineer II will be an STCW course that is the second in a two semester sequence in the comprehensive study of numerous designs and features of high- and medium-speed diesel engines including aspects of operation, maintenance and repair. Topics include: Governors and speed control systems, engine automation and control systems, electronic systems, communications, ventilation systems, turbines, and diesel safety. Laboratory hours consist of operation, maintenance, repair and management of the campus diesel fleet (minimum 6 hrs/week} and a journal kept. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MTOE 561.
[Spring]
Previously MTEO 562 Small Vessel Engineer II

MTOE 563 Marine Electrical Machinery and Systems
3 class hours, 2 laboratory hours, 3 credits.
This course is designed to provide Assistant Engineer Limited License (AELL) students with the basic knowledge and skills necessary to safely and effectively work with the electrical systems and equipment found aboard commercial towing vessels. The course of study will include a lecture portion to discuss the theory, design and operation of electrical circuits and machinery. A lab will supplement the lecture discussions and provide a setting for hands-on training and a venue to conduct assessments in the safe use of electrical instruments, methods for troubleshooting, and performing maintenance of electrical machinery/ equipment. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: ENGR 542, MTOE 561.
[Spring]
Previously MTEO 563 Small Vessel Electrical Machinery and Systems

MTOE 564 Engine Room Resource Management
2 class hours, 2 simulator hours, 3 credits.
A comprehensive review of equipment, materials, tools, personnel, onboard and remote information sources, communications, contacts and other resources available and at the disposal of the engineer of the watch to recognize what they each can/cannot do; how they inter-relate and might substitute for something else as an emergency back-up during various routine, non-routine, crisis and/or catastrophic events or situations. Engine room simulation exercises prepares engine room officers to handle dynamically escalating scenarios, emphasizing real life situation and mitigating tools to improve teamwork, leadership, communication, decision-making and resource management to maintain or restore power, electricity, safety, and other critical services. Engine room simulation training problem solving is critical to prevention of casualties, injuries, pollution events, and premature equipment failures. Self-discipline, responsibility and, accountability will be emphasized together with the other characteristics and skills of leadership and sensitivity to personnel, cultures, society, and the environment. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: ENGR 510.
[Fall]
Previously MTOE 201 Small Vessel Resource Management

NAUTICAL SCIENCE

NAUT 102 Introduction to Vessel Operations and Seamanship
3 laboratory hours, 1 credit.
This course will introduce the student to the current practice of seamanship and safe work practices afloat and in the maritime environment. Students will be introduced to industry safety protocol and concurrent OSHA requirements for a safe workplace. This course contains required subjects for Ratings Forming Part of a Navigation Watch as incorporated in the current STCW regulations. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
[Fall and Spring]

NAUT 308 Nautical Operations: Safety
2 class hours, 2 credits.
This course is designed to meet two specific licensing requirements: Advanced Firefighting and Survival Craft Crewman. Each of these subjects is an endorsement on the Third Mate and Third Assistant engineer's license. The first seven weeks of this class (14 hours) will be devoted to Advanced Fire Fighting. An additional eight hours of practical training is held at the fire field. The second portion of this class, an additional 14 hours, will concentrate on survival craft operations and shipboard evacuation procedures. Students will learn to plan and implement evacuation plans, conduct drills and gain familiarity with survival craft operations and deployment. The practical assessment for this class will be held during the Pre-cruise period for all cadets. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MT 510 or ENGR 510.
[Fall and Spring]

NAUT 314 Rules of the Road
2 class hours, 2 credits.
Laws and rules for prevention of collision at sea, pertinent U. S. court decisions, practical application of rules to actual situations. Exposure to visual aspects of rules of the road, through use of the College's bridge simulator. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MT 510.
[Fall and Spring]

NAUT 315 Introduction to Integrated Bridge Systems
3 class hours, 3 credits.
This class will introduce students to integrated bridge systems, electronic navigation and collision avoidance through the use of radar and ARPA. Students will split time between classroom lectures and time in the ARPA/Radar/ECDIS labs. Topics discussed include radar theory, manual and electronic plotting, interpretation of radar and use of radar as a navigation tool. Students will also be introduced to other electronic tools found in an integrated bridge environment such as AIS. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MT 510.
Corequisite: NAUT 314.
[Fall and Spring]

NAUT 416 Bridge Resource Management (Unlimited License)
1 class hour, 2 simulator hours, 3 credits.
This simulator-based course is designed to enhance the potential Third Mate's decision-making skills as it applies to traffic and voyage planning situations. Practical application of Rules of the Road and development of correct bridge procedures will be emphasized. Open sea and harbor conditions will be simulated for day as well as night using the simulator. Each watch team has 2 simulator hours and 1 class hour per week. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: NAUT 314, NAUT 315, MT 520 or MT 521 or MTOD 524.
[Fall and Spring]

NAUT 420 Piloting & Ship Handling for the Mariner
1 class hour, 3 laboratory hours, 3 credits.
Piloting and ship handling for the mariner will serve two vital areas for the mariner. In piloting, the cadet will garner the skills required to pilot, safely and professionally, for a particular waterway. In ship handling, previously learned ship handling characteristics will be reinforced and improved using old and new methods.
Prerequisite: MTO 112.

NAUT 460 Coastal Operations
1 class hour, 4 laboratory hours, 3 credits.
This course is designed to help the student better understand ship handling, maneuvering, watch-standing in Near Coastal and Inland waters, and operations on deck (anchoring, line handling, and drills) aboard an operating vessel. This will include communications and hands-on experience onboard the vessel to accomplish tasks as a crew. Projects will be intended for the student to have a better understanding of the vessel they will be working with, as well as a specialized field they may want to pursue in their careers.
Prerequisite: MT 530, Senior standing.

NAUT 476 Fast Rescue Boat Operations and Small Boat Handling
1 class hour, 3 laboratory hours, 3 credits.
Course provides a Coast Guard approved certification in Fast Rescue Boat operations meeting STCW requirements, Table A-VI/2-2 and as described in NAVIC 3-00. The course of instruction will: allow students to experience small vessel handling techniques and safe operational practices used in both rescue craft and commercial operations; introduce students to mechanical systems found on small vessels; introduce students to small vessel design and commercial types; introduce students to small vessel management considerations such as passenger vessel security and emergency preparedness. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MT 530, Senior standing.

NAVIGATION

NAVG 112 Navigation I: Introduction to Navigation
4 class hours, 4 credits.
This class will introduce the student to current navigational techniques used in commercial vessel operations. Introduction to piloting techniques and chartwork. Introduction to voyage planning and use of publications. Tide and current theory and calculations, set and drift problems, visibility of lights, and the Pilot Chart. Compasses and compass error. Analysis and determination of the terrestrial fix. Introduction to electronic charts. Estimated time of arrival and speed required. Introduction to time and nautical astronomy. Extensive plotting and chartwork. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Corequisites: MATH 090, MTO 112.
[Fall and Spring]
Previously Terrestrial Navigation.

NAVG 212 Navigation II: Oceans
4 class hours, 4 credits.
This class will introduce the student to celestial navigation and ocean navigation (the sailings). Topics include: The theory of celestial navigation; the celestial sphere; the navigational spherical triangle; time and its application; Development of the celestial line of position. Celestial sight reduction: spherical trigonometry formulas and sight reduction tables: the use of the Nautical Almanac; determination of latitude; determination of time of celestial phenomena; compass error from azimuths and amplitudes of celestial bodies. The Sailings: Great Circle, Mid-Latitude, Mercator and their use in voyage planning. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisite: MATH 090, NAVG 112.
[Spring]
Previously Celestial Navigation.

NAVG 312 Integrated Bridge Systems and Voyage Planning
4 class hours, 4 credits.
Integrated bridge systems. Discussion of electronic tools used in collision avoidance and position finding in Integrated Bridge Systems. Theory, operation and integration of electronic navigation systems including ECDIS, GPS, AIS, Fathometer, and Radar/ARPA as found in an integrated bridge environment. Dangers and limitations of equipment and inputs. Piloting and navigation using radar, ECDIS simulators. Elements of voyage planning and implementation of both a chart based and ECDIS based voyage plan showing waypoints and other appropriate information. A course project will include a complete trans-oceanic voyage plan. In compliance with international STCW requirements, there will be no D or D+ grades in this course. Open only to students for whom this course is a requirement for their degree program or minor, or by permission of the department chair.
Prerequisites: NAUT 314, NAUT 315, MT 520 or MT 521 or MTOD 524.
[Fall and Spring]
Previously Electronic Navigation.

NAVAL SCIENCE

Naval Science courses required for NROTC College Program, Scholarship, Strategic Sealift Midshipmen Program (SSMP), Seaman-to-Admiral 21 (STA-21) Officer Candidates, and Marine Enlisted Commissioning and Education Program (MECEP) students.

NVSC 150-151 Naval Science Laboratory
NVSC 250-251
NVSC 350-351
NVSC 450-451
NVSC 550-551
2 class hours, 1 credit, each.
Required of all NROTC students. Midshipmen are provided the opportunity in laboratory to develop personally while participating in activities as a team leader or team member. Naval Science Laboratories are a blend of academic lectures on naval theory and naval administration and practical training in physical readiness, military discipline and an appreciation of the customs and traditions of the Naval Service. Required of and open only to all NROTC students.
Pass/Fail.
[Fall (NVSC x50) – Spring (NVSC x51)]

NVSC 101 Introduction to Naval Science
3 class hours, 3 credits.
This course offers an introduction to the U.S. Navy and Marine Corps, emphasizing each branch's mission, capabilities and organization. It will cover naval courtesy, customs, leadership, officer and enlisted rank structure, and professional nomenclature. Required for all SSMP, NROTC scholarship and College Program midshipmen.
[Fall]

NVSC 102 Sea Power and Maritime Affairs
3 class hours, 3 credits.
A historical survey of the U.S. Navy and Marine Corps that focuses on the influence of sea power upon world history. This course explores the major events, significant figures, and circumstances that have imbued the U.S. Navy with its proud history and rich tradition. It focuses on the varying maritime philosophies which were interpreted into naval strategies/doctrines, the budgetary concerns that shaped force realities, and the pursuit of American diplomatic objectives. Required for all NROTC scholarship and College Program midshipmen.
[Spring]

NVSC 201 Leadership and Management
3 class hours, 3 credits.
Advanced organizational behavior and management in the context of the naval organization. Major behavioral theories are explored in detail. Practical applications are explored by the use of experimental exercises, case studies, and laboratory discussions. Required for all NROTC scholarship, College Program, and STA-21 midshipmen.
[Spring]

NVSC 204 Naval Science for the Strategic Sealift Officer
3 class hours, 3 credits.
Introduction to the functional coordination of the Merchant fleet with the Navy in peacetime, during international tension, or during formally declared war. Naval control of shipping, operations, communications, offensive and defensive procedures and weaponry for merchant ships are covered in detail. Required for all SSMP students.
Prerequisite: NVSC 101.
[Spring]

NVSC 211 Navigation
4 class hours, 3 credits.
Piloting and celestial navigation including theory, principles, procedures, the use of charts, visual and electronic aids, and the theory and operation of magnetic and gyro compasses. Celestial navigation is covered in depth. Practical skills are developed. Topics include tides, currents, effects of wind and weather, plotting, use of navigation systems, and a day's work in navigation. Required of all Navy option NROTC midshipmen who are not in a deck license program.
[Fall]

NVSC 303 Naval Ship Systems II (Weapons)
3 class hours, 3 credits.
Modern naval weapons from a systems approach, with examples from today's fleet. Attention is given to airborne, surface and sub-surface platforms. This course outlines the theory and employment of weapons systems. The facets of command, control, and communications are explored as a means of weapons system integration. Required of all Navy option NROTC midshipmen.
[Spring]

NVSC 304 Naval Ship Systems I (Engineering)
3 class hours, 3 credits.
A study of ship characteristics and types including ship design, hydrodynamic forces, stability, compartmentation, propulsion, electrical and auxiliary systems, interior communications, ship control, and damage control; theory and design of steam, gas turbine, and nuclear propulsion; shipboard safety and firefighting. Required of all Navy option NROTC midshipmen who are not in an engine license program.
[Fall]

NVSC 311 Evolution of Warfare
3 class hours, 3 credits.
History of warfare, focusing on the impact of major military theorists, strategies, tacticians, and technological development. Required of all Marine Option NROTC Midshipmen and MECEP students. Limited to juniors only.
[Fall]

NVSC 312 Fundamentals of Maneuver Warfare
3 class hours, 3 credits.
The purpose of this course is to introduce the student to the foundational concepts and history of the USMC as the premier Maneuver Warfighting Organization. It is a theoretical class that utilizes both historical examples from previous military operations as well as current doctrine, developing an individual who is both a critical thinker and scholar in the profession of arms. The goal is to educate the student to read military history analytically not to memorize facts. Required of and open only to Marine Officer candidates from SUNY Maritime, Fordham, and Columbia.
[Spring]

NVSC 402 Leadership and Ethics
3 class hours, 3 credits.
The study of naval junior officer responsibilities in naval administration. This capstone course in the NROTC curriculum builds on and integrates the professional competencies developed in prior course work and professional training. Required of all NROTC, SSMP, STA-21, and MECEP students.
[Spring]

NVSC 403 Naval Operations and Seamanship
3 class hours, 3 credits.
A study of nautical rules of the road, relative-motion vector analysis theory, relative motion problems, formation tactics, and ship employment. Also included are an introduction to naval operations analysis, ship behavior and characteristics in maneuvering, applied aspects of ship handling, and afloat communications. Required of all Navy option NROTC midshipmen.
[Fall]

OCEANOGRAPHY

OCEA 101 General Oceanography
3 class hours, 3 credits.
Topics include: Earth structure, plate tectonics, marine provinces, marine sediment, seawater chemistry and density structure, atmospheric circulation, oceanic circulation, waves, tides, coasts, marine productivity and energy.
SUNY-GER: Natural Sciences (with OCEA 102).
[Spring]

OCEA 102 General Oceanography Laboratory
2 laboratory hours, 1 credit.
This is the laboratory course that accompanies OCEA 101 General Oceanography. This hands-on laboratory course is designed to familiarize students with the concepts and techniques associated/introduced in the lecture.
Corequisite: OCEA 101.
SUNY-GER: Natural Sciences (with OCEA 101).
[Spring]

OCEA 308 Dynamic Oceanography
3 class hours, 3 credits.
Topics include: Heat budget of earth and ocean, wind-driven surface ocean circulation, hydrostatics, equation of state of seawater, equations of motion, geostrophic flow, Ekman transport, vorticity, major current systems, regional oceanography, thermohaline circulation and water masses, waves, tides.
Prerequisites: MATH 102 or MATH 112, PHYS 214, OCEA 101.

OCEA 402 Coastal Processes and Management
3 class hours, 3 credits.
This course will discuss coastal oceanographic processes, the formation of coastal landscapes, and coastal change. Topics include: wave dynamics, sediment transport, coastal geomorphology, coastal resources, climate change, coastal hazards, and coastal restoration and management. Emphasis will be placed on characterizing coastal settings and applying appropriate coastal zone management practices that minimize the impacts of coastal change.
Prerequisite: OCEA 101 and 102
Corequisite: ES 303
[Spring]

OCEA 414 Marine Geology
3 class hours, 3 credits.
Matter & Minerals. Rock types. Igneous, Sedimentary, Metamorphic. Geologic Time. Shorelines. Earthquakes, Seismology and Earth's Interior. Sea Floor Spreading,
Continental Drift, and Plate Tectonics.
Prerequisites: OCEA 101.

OCEA 415 Marine Biogeochemistry
3 class hours, 3 credits.
Chemical oceanography, chemical and biological processes affecting gases, nutrients and trace metals in seawater, seawater composition, oceanic distribution of chemical species, carbon an nutrient cycling, redox reactions on seawater, diagenesis, hydrothermal vents, marine organic chemistry
Prerequisites: CHEM 121, OCEA 101.
[Spring - Odd Years]

OCEA 425 Marine Environmental Issues
3 class hours, 3 credits.
Focus will be on selected anthropogenic non-pollution-related impacts on the ocean environment including exploitation of marine energy resources.
Prerequisites: CHEM 100 or CHEM 121, OCEA 101.
[Fall – Even Year

OCEA 610 Special Topics in Oceanography
3 class hours, 3 credits.
Theoretical and/or experimental investigation of contemporary topics or problems in oceanography.
Prerequisite: As specified by the department chair.

PHYSICAL EDUCATION

PE 100 Swimming and Lifetime Fitness
2 class hours, 1 credit
This is a swimming and wellness course that combines academic work with lab exercises in the swimming pool. This course includes stroke development, conditioning, water safety training and lifetime fitness.
[Fall and Spring]

PE 101 Lifetime Fitness and Conditioning
2 class hours, 1 credit.
The study of Exercise Physiology in an academic, as well as an activity mode. Exams from classroom work and activity labs and fitness testing would be required.
[Fall and Spring]

PE 2xx Lifetime Sports
2 class hours, 1 credit.
The 200-level courses involve specific sports training, and skills development unique to that particular individual or team sport. This could include such activities as Basketball, Soccer Volleyball Tennis, Rowing, Sailing. The course numbering will be sport-specific (PE 201 Basketball, etc.). *For PE 219 (Learn to Sail), PE 220 (Safe Powerboat Handling), and PE 260 (Kayaking): students must successfully complete a swimming assessment on the first day of class to confirm they are able to swim 50 yards and don a personal flotation device in the water.*

PE 301 Nutrition for Health, Exercise, and Sports
3 credits, 3 class hours.
This is a course about food, fitness, and physiology. The course will explore the relationship between nutrition, exercise and health and wellness.

PE 350 Intercollegiate Athletic Participation
One full season, 1 credit.
Requires being an active member on any of the College's Varsity Sport teams. Pass/Fail

PE 360 USMC Bulldog Preparation
2 class hours, 1 credit.
Required of all MECEP and Marine Option Midshipmen. Bulldog Prep is a course designed to prepare individuals for the rigors of Marine Corps Officer Candidates School. Marines and Midshipmen are provided the opportunity to develop leadership, team spirit, and physical fitness, while participating in physical training. The training includes, but is not limited to: conditioning runs, weight training, calisthenics, and cross-training. This class is only open to NROTC students. Pass/Fail.

PHYSICS

PHYS 102 Engineering Physics I
4 class hours, 4 credits.
A calculus -based mechanics course focused on basic standards and unit conversions, vector algebra, translational kinematics, particle dynamics, work and energy, impulse and momentum, rotational kinematics and dynamics, static equilibrium and static fluids. Credit will not be given for both this course and PHYS 211.
Prerequisite: MATH 101.
SUNY-GER: Natural Sciences (with PHYS 104).
[Fall and Spring]

PHYS 104 Engineering Physics I Lab
2 laboratory hours fortnightly, 0.5 credits.
Measurements with error analysis, experiments in mechanics. Credit will not be given for both this course and PHYS 213.
Corequisite: PHYS 102.
SUNY-GER: Natural Sciences (with PHYS 102).
[Fall and Spring]

PHYS 201 Engineering Physics II
4 class hours, 4 credits.
Electric field and potential, D.C. circuits, Magnetic fields, Faraday's Law, inductance and capacitance, AC circuits, wave motion, EM waves and spectrum. Credit will not be given for both this course and PHYS 214.
Prerequisite: A grade of C- or better in PHYS 102.
SUNY-GER: Natural Sciences (with PHYS 203).
[Fall and Spring]

PHYS 203 Engineering Physics II Lab
2 laboratory hours fortnightly, 0.5 credits.
Measurements with error analysis, experiments in electricity and magnetism, waves. Credit will not be given for both this course and PHYS 216.
Corequisite: PHYS 201.
SUNY-GER: Natural Sciences (with PHYS 201).
[Fall and Spring]

PHYS 211 General Physics I
3 class hours, 3 credits.
Topics include: unit conversions, vector algebra, translational kinematics, particle dynamics, work and energy, momentum, rotational kinematics and dynamics, fluid statics, heat, and calorimetry. Credit will not be given for both this course and PHYS 102.
Prerequisite: MATH 090.
SUNY-GER: Natural Sciences (with PHYS 213).
[Fall and Spring]

PHYS 213 General Physics I Lab
2 laboratory hours fortnightly, 0.5 credit.
Measurements and errors, experiments in mechanics and heat. Credit will not be given for both this course and PHYS 104.
Corequisite: PHYS 211.
SUNY-GER: Natural Sciences (with PHYS 211).
[Fall and Spring]

PHYS 214 General Physics II
4 class hours, 4 credits.
Thermodynamics, electric field and potential, DC circuits, magnetic fields, Faraday's Law, AC circuits, waves (sound and electromagnetic radiation), interference and diffraction of waves, optics (mirror and lenses). Credit will not be given for both this course and PHYS 201.
Prerequisite: PHYS 211 or PHYS 102.
Corequisite: MATH 101 or MATH 111.
SUNY-GER: Natural Sciences (with PHYS 216).
[Spring]

PHYS 216 General Physics II Lab
2 laboratory hours fortnightly, 0.5 credit.
Measurements and errors, experiments in electricity and magnetism, spectroscopy. Credit will not be given for both this course and PHYS 203.
Corequisite: PHYS 214.
SUNY-GER: Natural Sciences (with PHYS 214).
[Spring]

PROFESSIONAL STUDIES

PS 210 ECDIS – Limited Deck License
3 laboratory hours, 1 credit.
Continuing Education USCG approved short course, number SUNYDP-179, to meet 2010 STCW Amendments ECDIS (Electronic Chart Display and Information Systems) requirements.
Prerequisites: NAVG 112, MT 510.

SPANISH

SPAN 101 Spanish I
3 class hours, 3 credits.
Spanish I is an introductory course. It is designed to develop the basic skills of listening, speaking, reading, and writing in Spanish at an elementary level. Native speakers, bilingual speakers, and students with more than one year of high school Spanish are not eligible for this course.

SPAN 102 Spanish II
3 class hours, 3 credits.
Spanish II is a second semester, introductory course. It is designed to further develop the skills of listening, speaking, reading, and writing in Spanish at an elementary level.
Prerequisite: SPAN 101 or consent of instructor.

SOCIAL SCIENCE

SS 400 Fundamentals of International Relations
3 class hours, 3 credits.
An examination of major factors which determine the nature of international relations. Topics to be discussed include the origins of the nation-state system, the role of military power, the economic element of international relations, the nature of diplomacy, and the role of international law.

SS 610-611 Special Topics in History and the Social Sciences I-II
3 class hours, 3 credits each.
Special topics for qualified students interested in acquiring a broader knowledge of the social sciences.

STATISTICS

STAT 301 Statistics II
3 class hours, 3 credits.
Calculus based statistics course. Random variables and distributions. Bivariate and multivariate distributions. Markov chains. Bayesian statistics.
Prerequisite: MATH 211, MATH 251 or ENGR 345
[Spring]

STAT 401 Time Series Analysis
3 class hours, 3 credits.
Introduction to Random Walk, Martingale Process, Regression models and Time Series models. Use of Python library Sci-kit Learn to implement Times Series models such as ARIMA.
Prerequisite: CS 202, MATH 251 or ENGR 345, MATH 311
[Spring]

STAT 610 Special Topics in Statistics
1, 2, 3 or 4 credits.
Significant topics in probabilistic methods, statistics or statistical learning that reflect the interest of both the students and the instructor.
Prerequisite: Determined by the department chair

COURSES IN RESERVE

Courses not offered in the last five years may be offered in the future if a department determines a need for the course.

ASTR 202 Descriptive Astronomy
3 class hours, 3 credits.
Celestial sphere; solar system; theories of the evolution of the solar system: star identification; physics of the stars; star clusters and nebulae; galactic systems; evolution of the universe.
Placed in Courses in Reserve 3/27/13.

CHEM 420 Chemistry of Hazardous Materials
3 class hours, 3 credits.
Physical and chemical properties of hazardous materials; flammability principles; compressed gases; cryogens; chemistry of combustion; chemistry of fire extinguishment; common substances; corrosives; water reactive materials; toxic materials; radioactive materials; radiation hazards.
Placed in Courses in Reserve 3/27/13.

CHIN 101 Mandarin I
3 class hours, 3 credits.
An introduction to the language and culture of China. Intensive conversational Chinese spoken here!
Placed in Courses in Reserve 9/12/19.

CHIN 102 Mandarin II
3 class hours, 3 credits.
An introduction to the language and culture of China; a continuation of CHIN 101, Mandarin I.
Prerequisite: CHIN 101.
Placed in Courses in Reserve 9/12/19.

ENGL 408 Modern Poetry
3 class hours, 3 credits.
A study of modern poetry. This course traces the development of English and American poetry since World War I, from the formalism of the early 20th-century through the emergence of free-verse, and including recent developments in post-modern poetry. Prerequisite: HUMN 201 or HUMN 202.
Placed in Courses in Reserve 10/16/13.

ENGL 410 Greek Drama
3 class hours, 3 credits.
Reading and discussion of plays from the Athenian Golden Age. Works to be studied include the two classic tragic trilogies, plus several comedies. Includes re-enactments of scenes and plays.
Prerequisite: HUMN 201 or HUMN 202.
SUNY-GER: The Arts.
Placed in Courses in Reserve 10/16/13.

ENGL 411-412 The Novel I-II
3 class hours, 3 credits each.
Reading and discussion of major novelists. Consideration of the novel as a genre.
Prerequisite: HUMN 201 or HUMN 202.
SUNY-GER: The Arts (ENGL 411 only).
Placed in Courses in Reserve 10/16/13.

ENGL 418 Contemporary Literature
3 class hours, 3 credits.
A study of literature written during the past eighty years, leading to the many styles of today. The movement from modernism to post-modernism will be traced through novels and short stories from around the world. Emphasis is placed on introducing new voices, from a diversity of cultures.
Prerequisite: HUMN 201 or HUMN 202.
Placed in Courses in Reserve 10/16/13.

ENGL 420 Comedy
3 class hours, 3 credits.
Reading of comic works by several major authors. Consideration of the range and nature of comedy and of comedy as a genre.
Prerequisite: HUMN 201 or HUMN 202.
Placed in Courses in Reserve 10/16/13.

ENGR 102 Introduction to Engineering
1 class hour, 1 credit.
Introduces students to the engineering profession, ethics, problem-solving techniques and tools. Engineering communications techniques are stressed. Design methodology is introduced.
Placed in Courses in Reserve 4/6/11.

ENGR 523 Cadet Observer in Limited Horsepower Operations
6 credits.
This course subjects the student seeking engineering certification for limited horsepower vessels to an intense practical, professional learning experience aboard a working tug or supply vessel. The intent is that the student will encounter and address situations where his or her technical knowledge is relevant and applicable, but at the same time encountering situations where that knowledge that will be placed in a recognizable, applied context. Cadet Observer status should comprise a work experience of no less than sixty sea days. An extensive sea project is required to satisfy applicable USCG and STCW requirements and prepare candidate for DDE license exam.
Prerequisite: ENGR 551.
Placed in Courses in Reserve 4/6/11.

ENGR 551 DDE I (Designated Duty Engineer)
2 class hours, 6 laboratory hours, 4 credits.
The first of a two semester sequence in the comprehensive study of numerous designs and features of medium and high speed marine diesel engines including aspects of operation, maintenance and repair. Topics include: basic engine types and applications, engine construction and the details of engine parts, fuels, fuel analysis and handling, fuel and air systems. Laboratory hours consist of operation, maintenance, repair and management of the campus diesel fleet under the supervision of the Tug Engineer and Director of Small Vessel Operations, will be individually arranged (minimum 6 hrs/week} and a journal kept. Students cannot receive credit for this course and for ENGR 530 Summer Sea Term III.
Prerequisites: PS 112, ENGR 540.
Placed in Courses in Reserve 2/27/13.

ENGR 552 DDE II (Designated Duty Engineer)
2 class hours, 6 laboratory hours, 4 credits.
The second of a two semester sequence in the comprehensive study of numerous designs and features of medium and high speed marine diesel engines including aspects of operation, maintenance and repair. Topics include: exhaust and cooling systems, filters, starting and control systems, governors, reconditioning diesel engines, tune-up and trouble shooting. Laboratory hours consist of operation, maintenance, repair and management of the campus diesel fleet under the supervision of the Tug Engineer and Director of Small Vessel Operations, will be individually arranged (minimum 6 hrs/week) and a journal kept. Students cannot receive credit for this course and for
ENGR 530 Summer Sea Term III.
Prerequisite: ENGR 551.
Placed in Courses in Reserve 2/27/13.

ES 450 Field Work in Marine Environmental Science
2 laboratory hours, 1 credit.
Gathering and analysis of oceanographic and atmospheric data. Students, accompanied by several MES faculty, will spend 3 days and 2 nights (one weekend) aboard one of the college's vessels collecting samples and gathering data. Time will be arranged beforehand for preparatory work and afterward for the analysis of samples and data, and the presentation of write-ups.
Prerequisites: BIO 315, CHEM 311, METE 350, OCEA101.
Placed in Courses in Reserve 3/27/13.

GBEC 323 Banking and Financial Markets
3 class hours, 3 credits.
An examination of U.S. monetary and banking systems. Topics covered include the functioning of financial intermediaries, the role of the Federal Reserve System, the Securities and Exchange Commission and other regulators, and the structure and performance of domestic and global financial markets.
Prerequisite: GBEC 122.
Placed in Courses in Reserve 11/6/13.

GBEC 426 Labor Economics and Industrial Relations
3 class hours, 3 credits.
A study of the structure and economics of labor markets including determinants of wages and levels of employment, the practice of collective bargaining, labor legislation and maritime labor issues.
Prerequisite: GBEC 122.
Placed in Courses in Reserve 11/6/13.

GBMG 343 Organizational Behavior and Development
3 class hours, 3 credits.
This course examines individual and small group dynamics within the corporate structure. It applies behavioral science theory and research to issues such as management style, leadership, motivation, decision-making and problem solving. Goal-setting, power and conflict in organizations, and organizational change and development also are considered.
Prerequisite: GBMG 341.
Placed in Courses in Reserve 11/6/13.

GBMG 347 Entrepreneurship in International Transportation and Trade
3 class hours, 3 credits.
This course is designed to provide the student with an overview of entrepreneurship in international transportation and trade, including the critical features of starting and maintaining a new business venture or marketing a new product. The course takes the student entrepreneur from the product concept to making it a reality. Topics to be covered include: entrepreneurial ideas, innovation, and behavior, the role of entrepreneurs in business, financing and financial planning, legal aspects of new venture formation, organization of the venture, managerial functions pertaining to strategies, planning and human resource management, marketing the firm's products to potential customers and the ethical and social responsibilities of entrepreneurs. Class discussions and team activities will focus on the development of a suitable new entrepreneurial business and marketing plan.
Prerequisite: GBMG 345.
Placed in Courses in Reserve 11/6/13.

GBMG 444 Business, Government and Society
3 class hours, 3 credits.
A study of changes in the social, political and legal environment of business and their impact on management. The course reviews the regulatory obligations of corporations and analyzes current issues and proposals concerning technology, social change and business ideology. Emphasis is given to managing the corporation's actions in these and other areas through case analyses.
Prerequisite: GBUS 100.
Placed in Courses in Reserve 11/6/13.

GBMG 445 Public Administration in Transportation
3 class hours, 3 credits.
Topics include principles of administrative organization, methods of leadership and control, intergovernmental relations and public sector human resources management as well as budgeting, policy making and decision making in government organizations that manage or regulate transportation systems. Attention also is given to interactions with elected and appointed officials, legislative bodies, industry organizations and other interests groups.
Prerequisite: GBUS 100.
Placed in Courses in Reserve 11/6/13.

GBTT 359 Urban Transportation
3 class hours, 3 credits.
Public sector development, management and operations of people-moving systems. Transportation modes studied include subways, commuter rail, ferries and hydrofoils, cable traction and buses. Major cities' systems are examined, and employment opportunities in the field are discussed.
Prerequisite: GBUS 100.
Placed in Courses in Reserve 11/6/13.

GBTT 455 Advanced Transportation Management
3 class hours, 3 credits.
An advanced course in carrier organization and management. Topics include transportation operations, marketing, finance, purchasing, information systems and maintenance as well as human resources management and labor relations. The class examines national transportation policy, regulation and the changing environment of transportation. Activities include original research on problems in transportation management with emphasis on marine transportation.
Prerequisite: GBUS 100.
Placed in Courses in Reserve 11/6/13.

HIST 403-404 Topics in Recent History I-II
3 class hours, 3 credits each.
Consideration of selected topics in American or World History, 1945 to the present.
Prerequisite: HIST 102.
Placed in Courses in Reserve 10/16/13.

HUMN 407 Literature of Leadership
3 class hours, 3 credits.
This course analyzes the various positions taken throughout history regarding the responsibilities of the leader. Topics to be covered include: the rise to power, theory versus practice in the use of authority, "right authority" versus its abuse, and how societies deal with leaders who have gone astray.
Prerequisite: HUMN 201 or HUMN 202.
SUNY-GER: Humanities.
Placed in Courses in Reserve 10/16/13.

HUMN 458 Moral Choices in Literature
3 class hours, 3 credits.
We are taught to "do the right thing," but how do we recognize the right thing in order to choose properly? This course is organized in two parts: defining the right and the good; then, having the courage to act rightly in the face of social apathy or disapproval.
Prerequisite: HUMN 201 or HUMN 202.
Placed in Courses in Reserve 10/16/13.

MATH 301 Advanced Calculus
3 class hours, 3 credits.
Functions of several variables; vectors; differentials; Implicit Function Theorem; Inverse Function Theorem; extrema; line and surface integrals; Fourier series; partial differential equations.
Prerequisite: MATH 212.
Placed in Courses in Reserve 3/27/13.

MATH 302 Complex Variables
3 class hours, 3 credits.
Complex numbers, analytic functions; contour integration; Taylor and Laurent series; poles and residues; conformal mapping; applications.
Prerequisite: MATH 212.
Placed in Courses in Reserve 3/27/13.

PHYS 332 Modern Physics
3 class hours, 3 credits.
Electromagnetic radiation, quantum theory of radiation and matter, lasers, x rays, solid state devices, special relativity, nuclear radioactivity, nuclear reactions, nuclear fission and fusion.
Prerequisite: PHYS 201 or PHYS 214.
Placed in Courses in Reserve 3/27/13.

PHYS 363 Physics of Fluids
3 class hours, 3 credits.
Physics of fluids; structure of matter; hydrostatics: buoyancy, surface tension; hydrodynamics: Bernoulli's principle, laminar and turbulent flow; heat and thermodynamics: expansion of liquids and heat capacity; transfer processes: conduction, convection, radiation, ideal gas laws, phase equilibria, thermodynamic processes and cycles, first and second laws, entropy.
Prerequisite: PHYS 214.
Placed in Courses in Reserve 3/27/13.

COURSES DELETED FROM COURSE CATALOG

CHEM 610-611 Special Topics in Chemistry I-II
1, 2, or 3 credits each.
Theoretical or experimental investigation of special problems in either chemistry or metallurgy. Credits vary with problems.
Deleted 11/13/13.

CS 301 Data Structures
4 hours, 3 credits.
Techniques and algorithms for organizing and processing data. Data structures considered may include: text and binary files; contiguous and linked lists; stacks and queues; linked lists; trees; graphs. For each data structure, relevant processing algorithms (e.g., for traversing, searching, and sorting) will be considered, including recursive methods. Throughout the course, an object-oriented viewpoint via the concepts of encapsulation, inheritance, and polymorphism will be emphasized.
Prerequisite: CS 131.
Deleted 4/5/17.

CS 401 Database Systems
4 hours, 3 credits.
Survey of standard file organizations; introductory database concepts; the relational model and normalization; use of a relational database management system; object- oriented model; transaction management; distributed databases; database security.
Prerequisite: CS 131.
Deleted 4/5/17.

CS 480 Computer Engineering I
2 class hours, 2 laboratory hours, 3 credits.
An introduction to the design, construction, programming and operation of a micro- computer system; topics include: overall computer organization, CPU group, memory interfacing, assembly language programming, testing and debugging techniques; the initial phases of the design and construction of a microcomputer are included. Prerequisite: ENGR 388.
Deleted 4/5/17.

CS 490 Computer Engineering II
2 class hours, 2 laboratory hours, 3 credits.
Continuation of Computer Science 480. The input/output sections of a computer; types of I/0 devices; interfacing and programming; design projects including the design and construction of the I/0 portion of the computer, the interfacing of the display, keyboard and robot arm.
Prerequisite: CS 480.
Deleted 4/5/17.

ENGL 413 Novels of Latin America
3 class hours, 3 credits.
Latin America has produced several recent Nobel Prize winners in literature. The writing of the region reflects both the extreme political conflicts of today and the lingering effects of the region's historical and cultural past. Reading and discussion focus on both the historical and the magic realist schools of prose fiction.
Prerequisite: HUMN 201 or HUMN 202.
Deleted 2/12/14.

ENGR 299 Upper Division Qualification
0 credits.
A Passing grade in this course indicates successful completion of the Engineering Lower Division Subset Competencies for the Bachelor of Engineering degree programs, and is a prerequisite for upper division courses in engineering. Pass/Fail.
Deleted 11/13/13.

ENGR 302 Introduction to Renewable Energy Concepts
3 class hours, 3 credits.
A study of the effects of carbon based fuel on environment and an introduction to basics of renewable sources of energy such as solar-thermal, solar direct, wind, wave, hydrogen fuel cell, bio-fuel, bio-mass and nuclear.
Prerequisites: MATH 211, PHYS 201.
Renumbered/replaced by ENGR494 10/4/18.

ENGR 343 Engineering Analysis
3 class hours, 3 credits.
An introduction to mathematical and physical modeling of engineering differential systems. Analysis leading to solution of ordinary and partial differential equations by analytical and numerical techniques. Probability and statistics. The use of digital computers is stressed.
Prerequisite: MATH 212.
Deleted 10/4/18.

ENGR 384 Power Electronics
2 class hours, 2 laboratory hours, 3 credits.
Principles of power electronics, operating characteristics of bipolar junction transistors, IGBTs, MOSFETs and thyristors, power converters, basic switching circuits, AC/DC, DC/DC, DC/AC converters and their applications. A laboratory component requiring students to design, construct, diagnose and test power electronics converters is included.
Prerequisite: ENGR 387.
Deleted 10/4/18.

ENGR 421 Plant Facilities Design and Management I
4 class hours, 4 credits.
A basic introduction into the management, operation, design, construction and maintenance of large facilities and building complexes. Typical facilities studied are large medical centers and office complexes. Applications will demonstrate how the principles of transport processes, electrical theory and strength of materials apply to the under- standing of the basic construction concepts and operations of large facilities. Special emphasis is given to current co-generation techniques with utility rate structure analysis. This course, together with ENGR 422 are designed to give the engineering graduate a working knowledge required to enter the facilities field.
Prerequisites: ENGR 200, ENGR 242, ENGR 344, ENGR 345, ENGR 380.
Renumbered/replaced by ENGR 425 4/6/11.

ENGR 422 Plant Facilities Design and Management II
4 class hours, 4 credits.
Continuation of ENGR 421 (Plant Facilities Design and Management I).
Prerequisite: ENGR 421.
Renumbered/replaced by ENGR 426 4/6/11.

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ENGR 428 Computerized Control Systems
2 class hours, 2 laboratory hours, 3 credits.
This course has the dual goal of introducing students to computerized control systems and C programming. Students will use C to program single-board computers to monitor physical phenomena. In turn, the operations of the computer will be used to verify the correctness of the C programs. Students will be exposed to all fundamental aspects of C programming including: language syntax; sequence, selection, and repetition structures; procedures and functions; program design techniques, debugging, and maintenance.
Prerequisites: ENGR 120, ENGR 345 or ENGR 383.
Deleted 10/4/18.

ENGR 430 Data Networks
2 class hours, 2 laboratory hours, 3 credits.
This course is a survey of hardware, software, and protocols commonly used in constructing computer networks, with an emphasis on data transfer over TCP/IP networks. The objectives of this course are to (1) enable to student to design and implement small scale computer networks, (2) enable the student to troubleshoot and add units to existing networks, and (3) enable the student to write requirements and specifications for large scale networks. Lab periods will require students to use computers running a variety of operating systems.
Prerequisites: ENGR 120, MATH 102
Deleted 10/4/18.

ENGR 432 Information Assurance
2 class hours, 2 laboratory hours, 3 credits.
This course further develops networking protocols from ENGR 430 Data Networks with an emphasis on information assurance and security. The objectives of this course are (1) gain a basic understanding of the various types of network exploits that must be prevented, (2) gain an understanding of the software and network tools available for evaluating information assurance, and (3) gain experience in hardening networks and systems against intrusion, denial of service, and other security lapses. Lab periods will require students to use computers running a variety of operating systems.
Prerequisite: ENGR 430.
Deleted 10/4/18.

ENGR 483 Control Systems Theory
2 class hours, 2 laboratory Hours, 3 credits.
Analysis and control of feedback systems: transducers and their transfer functions; time domain and frequency response; stability criteria; classification of control equipment; performance specification and compensating networks.
Prerequisites: ENGR 120, ENGR 383.
Renumbered/replaced by ENGR 398 10/4/18.

ENGR 484 Electric Drives
2 class hours, 2 laboratory hours, 3 credits.
Students will learn a systematic design approach to motor drives using MATLAB and SIMULINK analysis simulation tools. Students will learn the fundamental principles of the subject, and extensive modeling, simulation, and analysis will be emphasized. Typical motor drives will be demonstrated for detailed industrial applications.
Prerequisite: ENGR 384.
Deleted 10/4/18.

ENGR 525 Industrial Internship I
6 credits.
An internship with a sponsoring industrial firm, requiring the intern to be assigned to duties requiring the practical application of engineering knowledge. These could include such tasks as inspection of existing equipment or systems, inspection of newly completed work, preparation of specifications for renovation or repair work, or development of maintenance plans and programs. The intern will keep a daily work log, and will retain work samples subject to the approval of his/her supervisor, as agreed with the intern's faculty advisor. The intern will receive a formal performance review upon completion of the internship, and must complete a substantial internship report to receive credit.
Prerequisites: Permission of the department chair, and completion of sophomore year in a relevant engineering discipline.
Renumbered/replaced by ENGR 526 10/4/18.

ENGR 535 Industrial Internship II
6 credits.
An internship with a sponsoring industrial firm, requiring the intern to be assigned to duties requiring the practical application of engineering analysis and design techniques, which could include such tasks as review and application of relevant codes to proposed renovation and repair work, completion of calculations pertaining to performance or sizing of equipment, completion of design specifications, estimates, and drawings, or preparation of reports and presentation materials. The intern will keep a daily work log, and will retain work samples subject to the approval of his/her supervisor, as agreed with the intern's faculty advisor. The intern will receive a formal performance review upon completion of the internship, and must complete a substantial internship report to receive credit.
Prerequisites: ENGR 525, permission of the department chair, and completion of the junior year in a relevant engineering discipline.
Renumbered/replaced by ENGR 536 10/4/18.

GBMG/MATH 446 Operations Research
3 class hours, 3 credits.
Quantitative methods for business-oriented decision and optimization problems. Topics chosen from among: linear programming and related sensitivity analysis; transportation problem; network and project-scheduling algorithms; queues; simulation; Markov processes; decision analysis. Use of software packages.
Prerequisite: ENGR 345 or MATH 251.
GBMG 446 Cross-reference deleted 3/28/12. MATH 446 course unchanged.

HIST 415 Topics in American Social History
3 class hours, 3 credits.
A consideration of several major social institutions and social phenomena in their American settings. Topics may include: the family, schools, sports, cities, immigration, and/or slavery.
Prerequisite: HIST 101 or HIST 102.
Deleted 2/12/14.

HIST 420 / NVSC 102 Sea Power and Maritime Affairs
Same as NVSC 102.
Prerequisite: HIST 101 or HIST 102.
HIST 420 Cross-reference deleted 4/6/11. NVSC 102 course unchanged.

HIST 422 Turning Points in American History
3 class hours, 3 credits.
The causes and consequences of the American Revolution, Civil War, and World War II. Attention is given to critical battles and the political, social, and economic influence of each war upon the development of American society.
Prerequisites: HIST 101, HIST 102.
Deleted 2/12/14.

HUMN 412 Models for Decision Making
3 class hours, 3 credits.
The principles of effective decision making. Topics range from such basic notions as "rationality" to such technical areas as Delphi forecasting.
Prerequisite: HUMN 201 or HUMN 202.
Deleted 2/12/14.

NAUT 408 License Seminar
4 class hours, 2 credits.
Lecture, discussions and problems dealing with subjects required by the U.S. Coast Guard for federal license as an officer in the merchant marine. In order to complete this course satisfactorily, each candidate for license is required to demonstrate, by qualifying examinations in all areas, his ability to become a fully qualified merchant marine officer. Examinations are administered to replicate conditions under which Federal exams are given.
Prerequisite: MT 530.
Replaced by MT 412 11/28/12.

NAVG 402 Advanced Marine Navigation
1 class hour, 2 laboratory hours, 2 credits.
The transition from navigation as an art to the science of problem solving, in preparation for the Federal License Exam for Third Mate in the US Merchant Marine. Additionally, an intensive review of all general subject matter related to shipboard navigation is accomplished. Examinations are administered to replicate conditions under which Federal exams are given.
Prerequisite: MT 530.
Replaced by MT 412 11/28/12.

NVSC 103 Basic Naval Science
1 class hour, 1 credit.
Introduction to Navy policies and Maritime affairs as they relate to the Merchant Marine Officer. The course covers Naval and Maritime evolutions, functions, missions, and strategy. Course is required for all freshman students except for MMR/NROTC scholarship and college program midshipmen and foreign students; freshman students may take NVSC 101 in lieu of NVSC 103.
Deleted 11/17/10.

OCEA 416 Marine Biogeochemistry Lab
3 laboratory hours, 1 credit.
Introduction to analytical chemistry of seawater; analyses of salinity, dissolved oxygen, dissolved nutrients in seawater; applications of seawater analyses to gas solubility, primary productivity and air/sea exchange of gases in a variety of marine environments.
Prerequisites: CHEM 121, OCEA 101.
[Spring – Odd Years]
Deleted 10/4/18.

PHYS 202 Engineering Physics Lab
2 laboratory hours every week, 1 credit.
Measurements and error analysis, mechanics, heat, electricity and magnetism experiments.
Corequisite: PHYS 201.
[Fall and Spring]
Deleted 4/5/17.

PHYS 610-611 Special Topics in Physics I-II
1, 2, or 3 credits each.
Theoretical or experimental investigation of special problems in either classical or modern physics.
Deleted 11/13/13.

PS 111 Professional Studies
2 class hours, 2 credits.
An introduction to the shipping industry, ships, and ship systems. Basic Transportation module: the shipping industry, ship nomenclature, organization, and construction. Basic Engineering module: propulsion plant nomenclature, components arrangements, and characteristics.
[Fall and Spring]
Deleted 10/4/18.