COLLEGE OF ENGINEERING

https://engineering.calpoly.edu

The College of Engineering is an internationally-recognized, premier undergraduate engineering college. Its mission is to provide an excellent Learn by Doing Engineering and Computer Science education that empowers all its students to innovate, design and create sustainable solutions to real-world challenges. The College vision is to be nationally recognized for its rapidly diversifying student population and unique, Learn by Doing educational and applied research experiences. With the integration of the Solano campus, the college's program offerings now also include unique maritime focused programs.

Cal Poly's engineering and computer science programs are strongly oriented toward preparing graduates for immediate entry into professional practice. Students declare their majors when they enter the university, and generally take at least one course in that major each quarter ensuring early engagement and motivation. This approach helps students master the foundational mathematics, science, and engineering principles essential for success in all engineering disciplines.

The College's bachelor of science programs provide the education needed for professional entry and advanced study. Cal Poly graduates are highly sought after by industry and pursue careers in engineering design, software and hardware development, systems analysis, manufacturing, applied research, and more. They find opportunities in industry, government, public utilities, and education, with many continuing to graduate study at Cal Poly or other institutions.

State-of-the-art facilities and laboratories form the foundation of the College's project-centered *Learn by Doing* curriculum. From the Aircraft Design Lab to the Rotor Dynamics Laboratory, students engage with advanced systems that bridge theory and practice. Signature facilities such as the Advanced Technology Laboratories (ATL), Bonderson Projects Center, and Engineering IV building promote interdisciplinary collaboration. The Bonderson Center offers 19,000 square feet of space for team-based projects and industry partnerships, while the 104,000-square-foot Engineering IV houses modern classrooms and labs for multiple disciplines. The ATL provides dedicated research and collaboration spaces that support innovation across programs.

At the Solano Campus, a key facility is the Training Ship Golden Bear (TSGB), where students are responsible for the safe operation of the ship's systems and its 17,000 hp twin-diesel main engine. To train students for situations that are difficult or unsafe to replicate aboard the TGSB, the campus also has a steam plant simulator and a diesel plant simulator. In addition to preparing students for careers in the maritime industry, the skills gained through courses in these facilities ready graduates for careers in power generation and facilities engineering.

The Noyce School of Applied Computing

The Noyce School of Applied Computing is a cross-college interdisciplinary school comprised of the Electrical Engineering department, the Computer Science and Software Engineering department, and the Computer Engineering department within the College of Engineering, and the Statistics department in the Bailey College of Science and Math. Together, these departments focus on applied computing research and industry collaboration, engaging in projects that leverage the strengths of Cal Poly's faculty and students.

The School supports student success through summer undergraduate research and Learn by Doing opportunities at Cal Poly and with industry partners. Faculty collaborations with industry bring real-world problems into the classroom and research environment, enhancing student engagement while advancing applied research

Engineering Student Services

Engineering South (40), Room 115
Phone: 805.756.1461

Engineering Student Services Staff: https://eadvise.calpoly.edu/about-us (https://eadvise.calpoly.edu/about-us/)

Engineering Student Services provides an inclusive, respectful, encouraging environment that fosters the retention and graduation of all undergraduate engineering students. Through our Advising, Multicultural Engineering (MEP), and International Exchange Program (IEP) our staff provides comprehensive services to guide and empower students to achieve their goals.

Advising Center

Engineering South (40), Room 115
Phone: 805.756.1461
https://eadvise.calpoly.edu

As a division of Engineering Student Services (https://eadvise.calpoly.edu/), the Advising Program is dedicated to providing accurate and timely academic resources and guidance to undergraduate engineering students. Through a welcoming and inclusive environment, advising's services promote student success and development while assisting students in navigating the curricula and university polices to reach their goals.

Multicultural Engineering Program (MEP)
Engineering South (40), Room 115
Phone: 805.756.1433

https://mep.calpoly.edu

As a division of Engineering Student Services (https://eadvise.calpoly.edu/), the Multicultural Engineering Program (MEP) is a retention program designed to provide equitable opportunities to undergraduate students who have been historically underserved in the College of Engineering at Cal Poly. MEP leverages a strong support network to build a community and provide the necessary bridges for students' academic success.

International Exchange Program (IEP)
Engineering South (40), Room 115
Phone: 805.756.1461
https://eadvise.calpoly.edu/International-Exchange-Program (https://eadvise.calpoly.edu/International-Exchange-Program/)

As a division of Engineering Student Services, the International Exchange Program (IEP) partners with engineering universities around the world. IEP strives to expose engineering students to the increasing demands of our global economy while allowing students to make progress towards their engineering degree.

Women's Engineering Program (WEP)
Engineering South (40), Room 113
Phone: 805.756.2350
http://wep.calpoly.edu

Director: Helene Finger
The Women's Engineering Program (WEP) supports the recruitment and retention of engineering and computer science students with the aim of reflecting the diverse demographics of California. WEP partners with a broad network of campus and community organizations to provide impactful outreach, on-campus support, and professional development opportunities. In close collaboration with the nationally recognized Cal Poly student section of the Society of Women Engineers (SWE), WEP supports a wide array of initiatives designed for pre-college, undergraduate, and graduate students.

Undergraduate Programs

- Aerospace Engineering (BS) (https://catalog.calpoly.edu/engineering/aerospace/aerospace-engineering-bs/)
- Biomedical Engineering (BS) (https://catalog.calpoly.edu/engineering/biomedical/biomedical-engineering-bs/)
- Civil Engineering (BS) (https://catalog.calpoly.edu/engineering/civil-environmental/civil-engineering-bs/)
- Computer Engineering (BS) (https://catalog.calpoly.edu/engineering/computer-engineering/computer-engineering-bs/)
- Computer Science (BS) (https://catalog.calpoly.edu/engineering/computer-science-software/computer-science-bs/)
- Electrical Engineering (BS) (https://catalog.calpoly.edu/engineering/electrical/electrical-engineering-bs/)
- Environmental Engineering (BS) (https://catalog.calpoly.edu/engineering/civil-environmental/environmental-engineering-bs/)
- Facilities Engineering Technology (BS) (https://catalog.calpoly.edu/engineering/facilities-engineering-technology-bs/)
- General Engineering (BS) (https://catalog.calpoly.edu/engineering/general/engineering-bs/)
- Industrial Engineering (BS) (https://catalog.calpoly.edu/engineering/industrial-manufacturing/industrial-engineering-bs/)
- Manufacturing Engineering (BS) (https://catalog.calpoly.edu/engineering/industrial-manufacturing/manufacturing-engineering-bs/)
- Marine Engineering Technology (BS) (https://catalog.calpoly.edu/engineering/marine-engineering-technology-bs/)
- Materials Engineering (BS) (https://catalog.calpoly.edu/engineering/materials/materials-engineering-bs/)
- Mechanical Engineering (BS) (Solano Campus) (https://catalog.calpoly.edu/engineering/mechanical-engineering-bs-solano/)
- Mechanical Engineering (BS)(San Luis Obispo Campus) (https://catalog.calpoly.edu/engineering/mechanical/mechanical-engineering-bs/)
- Software Engineering (BS) (https://catalog.calpoly.edu/engineering/computer-science-software/software-engineering-bs/)

Undergraduate Minors

- Computer Science Minor (https://catalog.calpoly.edu/engineering/computer-science-software/computer-science-minor/)
- Cross Disciplinary Studies Minor in Computing for Interactive Arts (https://catalog.calpoly.edu/engineering/computer-science-software/cross-disciplinary-computing-interactive-arts-minor/)

Graduate Programs

- Aerospace Engineering (MS) (https://catalog.calpoly.edu/engineering/aerospace/aerospace-engineering-ms/)
- Biomedical Engineering (MS) (https://catalog.calpoly.edu/engineering/biomedical/biomedical-engineering-ms/)
- Civil and Environmental Engineering (MS) (https://catalog.calpoly.edu/engineering/civil-environmental/civil-environmental-engineering-ms/)
- Computer Science (MS) (https://catalog.calpoly.edu/engineering/computer-science-software/computer-science-ms/)
- Electrical Engineering (MS) (https://catalog.calpoly.edu/engineering/electrical/electrical-engineering-ms/)
- Emergency Management Certificate (https://catalog.calpoly.edu/engineering/emergency-management-certificate/)
- Engineering Management (MS) (https://catalog.calpoly.edu/engineering/industrial-manufacturing/engineering-management-ms/)

- Fire Protection Engineering (MS) (https://catalog.calpoly.edu/engineering/fire-protection-engineering-ms/)
- Fire Protection Engineering Applications Graduate Certificate (https://catalog.calpoly.edu/engineering/fire-protection-engineering-applications-graduate-certificate/)
- Fire Protection Engineering Science Graduate Certificate (https://catalog.calpoly.edu/engineering/fire-protection-engineering-science-graduate-certificate/)
- Industrial Engineering (MS) (https://catalog.calpoly.edu/engineering/industrial-manufacturing/industrial-engineering-ms/)
- Mechanical Engineering (MS) (https://catalog.calpoly.edu/engineering/mechanical/mechanical-engineering-ms/)
- Transportation and Engineering Management (MS) (https://catalog.calpoly.edu/engineering/transporation-engineering-management-ms/)

CRU Courses

CRU 1100 Sea Training I - Deck (8 units)
Term Typically Offered: SU
Prerequisite: DL 100 or DL 1100; DL 105 or DL 1105L; DL 1105X or DL 105X; DL 110 or DL 1110; DL 120 or DL 1120; FF 100 or FF 1100; NAU 102 or NAU 1102, and NAU 102L or NAU 1102L with grades of C- or better; NAU 104 or NAU 1104; NAU 109 or NAU 1109; NAU 110 or NAU 1110; and a valid passport.

First sea training experience. During this period of training aboard the Training Ship, the emphasis is on ship familiarization, safety drills and training, basic deck watchstanding skills as helmsman and lookout, vessel maintenance and sanitation, and practical seamanship. Demonstrated competencies in selected STCW topics will be required. Formerly CRU 100 at Cal Maritime.

CRU 1150 Sea Training I - Engine (8 units)
Term Typically Offered: SU
Prerequisite: DL 105 or DL 1105; DL 105L or DL 1105L; DL 105X or DL 105X; EPO 110 or EPO 1110; EPO 125 or EPO 1125; FF 100 or FF 1100; and NAU 104 or NAU 1104. Corequisite: EPO 220 or EPO 220.

First at-sea experience on the training ship. Introduction to the fundamentals of engineering systems operations and shipboard routine, including operation and monitoring techniques for diesel propulsion, electrical power generation, and evaporators and support equipment. Duties during emergency situations such as fire, abandon ship, and rescue are also learned. Demonstrate the required STCW competencies and understand basic power plant operation and maintenance. Formerly CRU 150 at Cal Maritime.

CRU 2200 Sea Training II - Deck (5 units)
Term Typically Offered: SU
Prerequisite: DL 225 or DL 2225; DL 225L or DL 2225L; EGL 100 or EGL 1100; NAU 205 or NAU 2205; and NAU 230 or NAU 2230. Concurrent: CRU 200L or CRU 2200L.

Second at-sea training experience. Participate in a sea training program aboard an approved commercial or federal vessel. Period of onboard training consists of a minimum period of time, as specified in Cal Maritime's program approval letter, to meet Coast Guard sea service requirements. Document and analyze various aspects of shipboard operation and procedures as prescribed by the department. Guided analysis will constitute their project. Formerly CRU 200 at Cal Maritime.

CRU 2200L Sea Training II Lab (Deck) (3 units)
Term Typically Offered: SU
CR/NC
Prerequisite: DL 225 or DL 2225; DL 225L or DL 2225L; DL 240L or EL 2240L; EGL 100 or EGL 1100; NAU 205 or NAU 2205; and NAU 230 or NAU 2230. Concurrent: CRU 200 or CRU 2200.

Observations and tasks required by STCW. Completes a comprehensive check list that parallels the STCW standards for which they will be certified. Check list parallels STCW competencies but does not provide certification or equivalency. Credit/No Credit grading only. 3 laboratories. Formerly CRU 220L at Cal Maritime.

CRU 2250 Sea Training II - Engine (8 units)
Term Typically Offered: SU
Prerequisite: CRU 150 or CRU 1150; EPO 210 or EP 2210; EPO 213 or EPO 2213; EPO 215 or EPO 2215; EPO 220 or EPO 2220; and NAU 104 or NAU 1104 with grades of C- or better.

Sea training experience aboard a commercial or government vessel for students pursuing a USCG Third Assistants Engineer License. Comprehensive engineering report and performance evaluations by the ship's engineering officers. Commercial Cruise Project includes a journal of operational and maintenance experiences, technical descriptions and drawings of shipboard engineering systems, and a summary of measures to implement environmental and SOLAS regulations. Formerly CRU 250 at Cal Maritime.

CRU 3300 Sea Training III - Deck (8 units)
Term Typically Offered: SU
Prerequisite: CRU 200 or CRU 2200; DL 310 or DL 3310; DL 311 or DL 3311; DL 320 or DL 3320; NAU 300 or NAU 3300; NAU 300L or NAU 3300L; NAU 302 or NAU 3302; NAU 302L or NAU 302L; NAU 325 or NAU 3325; NAU 330 or NAU 3330; and FF 300 or FF 3300.

Third sea training experience. Period of training aboard the Training Ship, with emphasis on ship maneuvering skills, celestial navigation, collision avoidance, weather reporting, radio, communications, bridge team management, supervision of vessel maintenance, and bridge watchstanding as the cadet in charge. Demonstrate required competencies in STCW selected topics. Formerly CRU 300 at Cal Maritime.

CRU 3350 Sea Training III - Engine (8 units)
Term Typically Offered: SU
Prerequisite: CRU 250 or CRU 2250; and ENG 250L or ENG 250L; or ET 250L or ET 2250L; EPO 235 or EPO 2235; EPO 310 or EPO 3310; EPO 322 or EPO 3322; and EPO 322L or EPO 3322L.

During the sea training function as the supervisor and assumes responsibility for the proper performance of the first sea training students in engineering tasks. Responsibility as watch engineer, directly responsible to a licensed watch officer for the operation of all systems, ensuring that all data is properly taken and recorded and all duties properly performed. Responsibility as daywork assistant, maintaining and repairing equipment and systems under the supervision of an instructor. Responsibility as engineering assistant, carrying out Third Assistant duties under the supervision of the Chief Engineer. Demonstrate required STCW competencies and be ready to stand watch as a Third Assistant Engineer. Formerly CRU 350 at Cal Maritime.

CRU 3390 Independent Study (1-3 units)
Term Typically Offered: F, SP, SU
Prerequisite: Consent of department.

Substantial study above and beyond the regular offerings in the Academy catalog. Arrangement with an Academy faculty member to be the Independent Study Advisor. Approved Application for Independent Study must be on file. Formerly CRU 390 at Cal Maritime.

CRU 3395 Special Topics (1-3 units)
Term Typically Offered: F, SP, SU
Prerequisite: Consent of instructor.

Special topic courses are intended to enable each department to offer an elective course of study when faculty scholarship activities, the expertise of visiting faculty, or off-campus educational programs may afford a unique and worthwhile learning experience. 1 to 3 lectures. Formerly CRU 395 at Cal Maritime.

EM Courses

EM 5810 Disaster Mitigation and Preparedness (3 units)
Term Typically Offered: F
Prerequisite: Admission to the graduate certificate in Emergency Management program.

Hazard mitigation as well as implementation approaches and disaster planning. Techniques used in emergency operations planning, exercise design and evaluation, and public education are also covered. Course offered online only. 3 lectures. Formerly EM 810 at Cal Maritime.

EM 5820 Disaster Response and Risk Communication (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the graduate certificate in Emergency Management program.

Principles of disaster response and risk communication, theories of risk perception and risk behavior, and addresses challenges in communication with diverse audiences. Course offered online only. 3 lectures. Formerly EM 820 at Cal Maritime.

EM 5830 Disaster Recovery and Community Resilience (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the graduate certificate in Emergency Management program.

Disaster recovery from a social science perspective, as well as the role of emergency management programs in community resilience and sustainability. Course offered online only. 3 lectures. Formerly EM 830 at Cal Maritime.

EM 5840 Institutional Context and Disaster Policy (3 units)
Term Typically Offered: F
Prerequisite: Admission to the graduate certificate in Emergency Management program.

Analysis of political and administrative relationships that exist among governments in emergency management programs and disaster relief policy in the United States. Course offered online only. 3 lectures. Formerly EM 840 at Cal Maritime.

EM 5850 Emergency Management Program Evaluation (3 units)
Term Typically Offered: SU
Prerequisite: Admission to the graduate certificate in Emergency Management program.

Practical application of social science research methods to assess the effectiveness of emergency management policies and programs. Includes evaluation planning, cost-benefit analysis, and impact evaluation. Special attention placed on research design and approaches to inquiry (qualitative survey and focus group data collection, evaluation), and reporting research. Course offered online only. 3 lectures. Formerly EM 850 at Cal Maritime.

ENG Courses

ENG 1100 Engineering Graphics (2 units)
Term Typically Offered: F

Offered at Solano Campus. Introduction to engineering graphics, the primary media for developing and communicating engineering system design information. Preparation of technical drawings using drafting instruments and computer-aided design (CAD) software is based on ANSI standards and includes orthographic projections, dimensioning, and tolerances. 2 lectures. Formerly ENG 100 at Cal Maritime.

ENG 1110 Introduction to Engineering and Technology (1 unit)
Term Typically Offered: F

Offered at Solano Campus. Introduction to the engineering and technology professions and curricula, including the professional responsibilities of engineers and engineering technologists, the organization of the engineering and technology profession, and the library and internet research, along with outside speakers from the profession. 1 lecture. Formerly ENG 110 at Cal Maritime.

ENG 1112 Introduction to Technical Communication (2 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 1C
2020-26 catalogs: GE Area A1

Offered at Solano Campus. Introduction to oral communication with an emphasis on its application to the engineering profession. Development and practice in oral presentations to both technical and non-technical audiences. 2 lecture. Fulfills GE Area 1C (GE Area A1 for students on the 2020-26 catalogs). Formerly ENG 112 at Cal Maritime.

ENG 1120L Marine Engineering Laboratory (1 unit)
Term Typically Offered: SP

Offered at Solano Campus. Common shipboard systems, their functions, arrangement, major components and principles of operation. Shipboard electrical systems/electronics and electronic troubleshooting using electrical/electronic test equipment such as multimeters, the reading and interpretation of schematics, and the use of technical manuals. 1 laboratory. Formerly ENG 120L at Cal Maritime.

ENG 2210 Engineering Computer Programming (2 units)
Term Typically Offered: F
Concurrent: COM 210L or COM 2210L for Oceanography majors.

Offered at Solano Campus. Introduction to the use and engineering applications of MATLAB, and an introduction to computer programming using MATLAB. Main topics include array and matrix manipulation, plotting in 2 and 3 dimensions, solving linear systems of equations, and solving nonlinear equations. In addition, the basic programming constructs, including input and output formatting, functions, conditional statements, and loops are introduced. Introduction to linear algebra. 2 lectures. Formerly COM/ENG 210 at Cal Maritime.

ENG 2250 Electrical Circuits and Electronics (3 units)
Term Typically Offered: SP
Prerequisite: PHY 205 or PHY 2205. Concurrent: ENG 250L or ENG 2250L.

Offered at Solano Campus. Theory and analysis of DC and AC circuits. Real and ideal sources, power transfer and power factor. Resistor, capacitor, and inductor circuits, transient response, frequency response and transfer functions. Single phase and multiphase power systems, and amplifier circuits and semiconductor devices. 3 lectures. Formerly ENG 250 at Cal Maritime.

ENG 2250L Electrical Circuits and Electronics Laboratory (1 unit)
Term Typically Offered: SP
Prerequisite: PHY 205 or PHY 2205. Concurrent: ENG 250 or ENG 2250.

Offered at Solano Campus. Provides hands-on experience in circuit and electronics analysis to support instruction and theory. Use of meters, scopes and breadboard techniques to construct and measure transient and steady-state responses. MATLAB simulations used in response prediction. 1 laboratory. Formerly ENG 250L at Cal Maritime.

ENG 3310 Engineering Ethics (3 units)
Term Typically Offered: SP
2026-28 or later: Upper-Div GE Area 4
2020-26 catalogs: Upper-Div GE Area D
Prerequisite: Senior standing; and EGL 220 or EGL 2220.

Offered at Solano Campus. Addresses the major concepts of ethics as applied to the discipline and practice of engineering. Including the scope and aims of engineering ethics, moral reasoning and ethical theories, engineering and society, ethics and the law, the engineer's responsibility for safety, engineers and the corporation, conflict of interest/crime in the workplace, rights of engineers/rules of professional conduct, ethics, global ethical issues involving the engineering community, engineering ethics in the computer age, environmental ethics, engineers as managers and leaders, engineers as expert witnesses, and steps to principled reasoning/common rationalizations. 3 lectures. Fulfills GE Upper-Division 4 (GE Area Upper-Division D for students on the 2020-26 catalogs). Formerly ENG 310 at Cal Maritime.

ENG 4430 Naval Architecture (3 units)
Term Typically Offered: F
Prerequisite: One of the following: ET 332, ET 3332, ME 332, or ME 3332; and one of the following: ET 340, ET 3340, ME 340 or ME 3340.

Offered at Solano Campus. Covers ship nomenclature, initial and damaged stability theory and calculations, hull structural design considerations, ship resistance and propulsion power prediction. 3 lectures. Formerly ENG 430 at Cal Maritime.

ENG 4472 Facilities Management (3 units)
Term Typically Offered: SP
Prerequisite: One of the following: CEP 250, CEP 2250, CEP 270 or CEP 2270.

Offered at Solano Campus. Introductory course to the Facilities Engineering profession. Issues from various engineering and technology disciplines are covered and integrated into a structure consistent with the understanding and experiences needed in the facilities engineering management profession. 3 lectures. Formerly ENG 472 at Cal Maritime.

EPO Courses

EPO 1110 Plant Operations I (1 unit)
Term Typically Offered: F, SP
CR/NC

Inspection, maintenance, and repair of marine machinery and systems aboard the training ship. Safe and proper use of hand and power tools and the identification and repair of valves, pumps, fittings, piping, switches, controllers, and circuit breakers. Credit/No Credit grading only. 1 laboratory. Formerly EPO 110 at Cal Maritime.

EPO 1125 Introduction to Marine Engineering (3 units)
Term Typically Offered: F, SP
Concurrent: EPO 125L or EPO 1125L. Corequisite: EPO 110 or EPO 1110.

Introduction to marine engineering common shipboard systems, their function, arrangement, major components and principles of operation. Engineering systems aboard the Training Ship reinforce engineering system concepts. Shipboard practical training with the watch routine and safety equipment in preparation for follow-on practical training at sea. 3 lectures. Formerly EPO 125 at Cal Maritime.

EPO 1125L Introduction to Marine Engineering Laboratory (1 unit)
Term Typically Offered: F, SP
Concurrent: EPO 125 or EPO 1125. Corequisite: EPO 110 or EPO 1110.

Introduces primary engineering systems aboard the Training Ship. Shipboard familiarity while studying and tracing key systems such as engine jacket water, fuel oil, lubrication, cooling, and starting air. Additional topics include measurement methods, gear train and clutch, environmental protection, distillation, firefighting, and safety practices with essential marine engineering operations. 1 laboratory. Formerly EPO 125L at Cal Maritime.

EPO 2210 Plant Operations II (1 unit)
Term Typically Offered: F
CR/NC
Prerequisite: EPO 110 or EPO 1110.

Continuation of the practical work performed on the training ship or in facilities maintenance lab. Equipment maintenance on diesel engines, air compressors, generators, electrical equipment and pumps. Credit/No Credit grading only. 1 laboratory. Formerly EPO 210 at Cal Maritime.

EPO 2213 Welding Laboratory (1 unit)
Term Typically Offered: F, SP

Provides experience in welding, brazing, cutting, and burning techniques sufficient to effect emergency repairs and routine maintenance of engineering structures and systems. 1 laboratory. Formerly EPO 213 at Cal Maritime.

EPO 2214 Boilers (3 units)
Term Typically Offered: F, SP
Prerequisite: EPO 125 or EPO 1125.

Comprehensive study of fossil fuel steam generators, with emphasis on marine propulsion plants. The principles of boiler design and construction, boiler auxiliaries, principles of combustion, heat recovery equipment, automated boiler controls, and boiler water treatment. Prepares students for the steam plant section of the U.S. Coast Guard Third Assistant Engineer's Exam. 3 lectures. Formerly EPO 214 at Cal Maritime.

EPO 2215 Manufacturing Processes I (1 unit)
Term Typically Offered: F

Introduction to machine shop practices utilizing engine lathes and milling machines, precision measuring instruments, and hand tools. Execute designs developed in prior graphics design courses. 1 laboratory. Formerly EPO 215 at Cal Maritime.

EPO 2217 Shipboard Medical (1 unit)
Term Typically Offered: F, SP
Prerequisite: Senior standing.

Practical applications and the principles of First Aid and Medical Care. Includes body structure and function, resuscitation techniques, and bleeding control. Shock management, burns and scalds, cold and heat effects, rescue and casualty transport, toxicological hazards, spinal injuries, fractures, dislocation and muscular injuries, radio medical advice, pharmacology, sterilization, cardiac arrest and drowning. 1 laboratory. Formerly EPO 217 at Cal Maritime.

EPO 2220 Diesel Engineering I (1 unit)
Term Typically Offered: F, SP
Concurrent: EPO 220L or EPO 2220L.

Introduction to the internal combustion engine utilized by industry and merchant vessels. Includes basic theory, history of the diesel engine, gas exchange process, engine types, engine construction, engine parts, fuel injection, and merchant vessel propulsion. Emphasis given to the crosshead type slow-speed diesel engine. Preparation for the motor section of the USCG Third Assistant Engineer examination. 1 lecture. Formerly EPO 220 at Cal Maritime.

EPO 2220L Diesel Engineering I Laboratory (1 unit)
Term Typically Offered: F, SP
Concurrent: EPO 220 or EPO 2220.

Laboratory supporting Diesel Engineering I. 1 laboratory. Formerly EPO 220L at Cal Maritime.

EPO 2230 Steam Plant System Operations (1 unit)
Term Typically Offered: F, SP
Prerequisite: EPO 125 or EPO 1125; and CRU 150 or CRU 1150. Corequisite: EPO 214 or EPO 2214.

Introduction to the engineering systems, operating and emergency procedures, and watch requirements of a steam propulsion plant. Experience in the Steam Plant Simulator. 1 laboratory. Formerly EPO 230 at Cal Maritime.

EPO 2235 Steam Plant Watch Team Management (1 unit)
Term Typically Offered: F, SP
Prerequisite: EPO 214 or EPO 2214; and EPO 230 or EPO 2230.

Fault analysis techniques for steam propulsion plants, communication skills in a work environment, and management abilities. Experience in the Steam Plant Simulator. 1 laboratory. Formerly EPO 235 at Cal Maritime.

EPO 3310 Plant Operations III (1 unit)
Term Typically Offered: SP
Prerequisite: EPO 210 or EPO 2210.

Practical work performed on the training ship or in facilities maintenance. Supervision of equipment maintenance. Rotatation in working on main propulsion, electrical and auxiliary equipment. 1 laboratory. Formerly EPO 310 at Cal Maritime.

EPO 3312 Turbines (3 units)
Term Typically Offered: F, SP
Prerequisite: EPO 214 or EPO 2214.

Study of steam turbines, condensers, reduction gears, propulsion shafting, and gas turbines, with emphasis on marine propulsion plants. Steam and gas turbine controls, the thermodynamic principles of efficient steam plant operation, and operation and maintenance of turbines and their auxiliary systems are also included. Preparation for the steam plant section of the U.S. Coast Guard Third Assistant Engineer's Exam. 3 lectures. Formerly EPO 312 at Cal Maritime.

EPO 3315 Manufacturing Processes II (1 unit)
Term Typically Offered: SP
Prerequisite: EPO 215 or EPO 2215.

A continuation of Manufacturing Processes I, emphasizing work on metal lathes and vertical milling machines. 1 laboratory. Formerly EPO 315 at Cal Maritime.

EPO 3319 Facilities Engineering Diagnostics Laboratory (1 unit)
Term Typically Offered: F
Prerequisite: CRU 150 or CRU 1150.

Theory and application to machinery maintenance of vibration analysis, oil analysis, machinery alignment, thermography, and overall plant performance analysis. Study of various machinery maintenance programs applied to facilities engineering systems, including machinery history, trend analysis, and predictive maintenance. 1 laboratory. Formerly EPO 319 at Cal Maritime.

EPO 3321 Introduction to Power Generation Plants (1 unit)
Term Typically Offered: SP
Prerequisite: EPO 220 or EPO 2220.

Introduction to the operation, performance, and maintenance of simple cycle gas turbine, medium-speed reciprocating power generation systems, combined cycle gas turbine, and steam turbine power plants. The emphasis of this course is Power Plant Management and will train the students in common power plant systems and how they interact with each other. 1 laboratory. Formerly EPO 321 at Cal Maritime.

EPO 3322 Diesel Engineering II/Simulator (1 unit)
Term Typically Offered: F, SP
Prerequisite: EPO 220 or EPO 220. Concurrent: EPO 322L or EPO 3322L.

Engineering systems and components associated with diesel power plants. Includes exhaust treatment equipment and advanced engine technologies applied to the reduction of harmful emissions. Practical training in diesel engine systems, normal operations and maintenance, and casualty procedures. 1 lecture. Formerly EPO 322 at Cal Maritime.

EPO 3322L Diesel Engineering II/Simulator Laboratory (1 unit)
Term Typically Offered: F, SP
Prerequisite: EPO 220 or EPO 2220. Concurrent: EPO 322 or 3322.

Use Diesel Plant Simulator to operate a heavy-fuel diesel-propulsion plant under normal operating and emergency conditions. Diagnose combustion and machinery faults representative of those encountered in operating diesel power plants. Engine Team Management techniques utilizing the simulator as an instructional tool to train using good communication and problem solving even during stressful conditions. 1 laboratory. Formerly EPO 322L at Cal Maritime.

EPO 3343 Refrigeration & A/C (1 unit)
Term Typically Offered: SP
Prerequisite: ME 240 or ME 2241.

Introduction to refrigeration and air conditioning systems on merchant vessels. Basic thermodynamics theories of refrigeration systems: compressors, condensers, evaporators, control devices. Environmental regulations and requirements. Operational procedures: maintenance, troubleshooting and repair. 1 laboratory. Formerly EPO 343 at Cal Maritime.

EPO 3390 Independent Study (1-3 units)
Term Typically Offered: F, SP, SU
Prerequisite: Consent of instructor.

Substantial study above and beyond the regular offerings in the Academy catalog. Arrange with an Academy faculty member to be the Independent Study Advisor. Approved Application for Independent Study must be on file in the Office of the Registrar. Formerly EPO 390 at Cal Maritime.

EPO 3395 Special Topics (1-3 units)
Term Typically Offered: F, SP, SU
Prerequisite: Consent of instructor.

Special topic courses are intended to enable each department to offer an elective course of study when faculty scholarship activities, the expertise of visiting faculty, or off-campus educational programs may afford a unique and worthwhile learning experience. 1 to 3 lectures. Formerly EPO 395 at Cal Maritime.

ET Courses

ET 1110 Introduction to Engineering Technology (1 unit)
Term Typically Offered: F

Introduction to the engineering technology profession and curriculum. Engineering education, academic success strategies, and career opportunities. Field trips required. 1 lecture. Formerly ET 110 at Cal Maritime.

ET 2230 Properties of Materials (2 units)
Term Typically Offered: SP
Prerequisite: CHE 110 or CHE 1110; CHE 110L or CHE 1110L; and MTH 210 or MTH 2210.

Examination of the properties of materials from the atomic to the macroscopic levels, looking at crystal structures and the application of materials to engineering systems. Emphasis is on metals, and nonmetals. Mechanical properties, creep, fatigue, corrosion and failure characteristics. Current usage of advanced materials. 2 lectures. Formerly ET 230 at Cal Maritime.

ET 2230L Properties of Materials Laboratory (1 unit)
Term Typically Offered: F
Prerequisite: CHE 110 or CHE 1110; CHE 110L or CHE 1110L; ET 230 or ET 2230; and MTH 210 or MTH 2210.

Investigates the physical characteristics of materials through testing, data acquisition, and calculations. Tests conducted include tensile, fatigue, creep, impact energy, and hardenability. Learn how properties are derived. 1 laboratory. Formerly ET 230L at Cal Maritime.

ET 2232 Statics (3 units)
Term Typically Offered: SP
Prerequisite: MTH 210 or MTH 2210; PHY 200 or PHY 2200; and PHY 200L or PHY 2200L.

Force systems and the conditions of equilibrium for particles and rigid bodies are studied in two and three dimensions. Principles of equilibrium, moments, and dry friction are applied to engineering system components and structures. 3 lectures. Formerly ET 232 at Cal Maritime.

ET 2250 Electrical Circuits (3 units)
Term Typically Offered: F
Prerequisite: MTH 211 or MTH 2211; and PHY 205 or PHY 2205. Concurrent: ET 250L or ET 2250L.

Principles and applications of DC and AC circuit analysis, node and mesh equations, Thevenin equivalent circuits, maximum power transfer, first order transients, simple filters and amplifiers, phasors, power, power factor, and reactive power in single-phase systems. 3 lectures. Formerly ET 250 at Cal Maritime.

ET 2250L Electrical Circuits Laboratory (1 unit)
Term Typically Offered: F
Prerequisite: MTH 211 or MTH 2211; and PHY 205 or PHY 2205. Concurrent: ET 250 or ET 2250.

Application of circuit elements and principles in laboratory measurements and analysis. 1 laboratory. Forrmerly ET 250L at Cal Maritime.

ET 3330 Dynamics (3 units)
Term Typically Offered: F
Prerequisite: ET 232 or ET 2232.

Force systems and motion of particles and rigid bodies are studied in two and three dimensions. Principles of dependent and relative motion, work and energy, conservation of energy, and impulse and momentum are applied to engineering system components. 3 lectures. Formerly ET 330 at Cal Maritime.

ET 3332 Strength of Materials (3 units)
Term Typically Offered: F
Prerequisite: One of the following: ET 232, ET 2232, ME 232, or ME 2232; and MTH 211 or MTH 2211.

Basic concepts in strength of materials: normal, shear, bending, and bearing stress. Stress-strain relation and design properties of materials. Practical application of structure calculations for sizing bolts, rivets, shafts, beams, columns, and pressure vessels. 3 lectures. Formerly ET 332 at Cal Maritime.

ET 3340 Fluid Mechanics (3 units)
Term Typically Offered: SP
Prerequisite: MTH 211 or MTH 2211; and PHY 205 or PHY 2205. Concurrent: ET 340L or ET 3340L.

Application of principles of incompressible fluid flow. Includes forces in static fluids and fluids in motion, applications of Bernoulli's equation, pressure losses in pipe systems, open channel flows, pump selection, and air flow in ducts. 3 lectures. Formerly ET 340 at Cal Maritime.

ET 3340L Fluid Mechanics Laboratory (1 unit)
Term Typically Offered: SP
Prerequisite: MTH 211 or MTH 2211; and PHY 205 or PHY 2205. Concurrent: ET 340 or ET 3340.

Laboratory supporting Fluid Mechanics. 1 laboratory. Formerly ET 340L at Cal Maritime.

ET 3342 Refrigeration and Air Conditioning (2 units)
Term Typically Offered: SP
Prerequisite: One of the following: ET 344, ET 3344, ME 240, or ME 2240. Concurrent: ET 342L or ET 3342L.

Introduction to basic refrigeration and air conditioning principles and equipment. Theory and application of direct and indirect refrigeration cycles commonly found on merchant ships and ashore including main cargo freezers, air conditional systems, chill water systems, absorption systems, refrigerated vans, and ice machines. 2 lectures. Formerly ET 342 at Cal Maritime.

ET 3342L Refrigeration and Air Conditioning Laboratory (1 unit)
Term Typically Offered: SP
Prerequisite: ET 344 or ET 3344. Concurrent: ET 342 or ET 3342.

Refrigeration and air conditioning laboratory. 1 laboratory. Formerly ET 342L at Cal Maritime.

ET 3344 Thermodynamics (3 units)
Term Typically Offered: F
Prerequisite: PHY 200 or PHY 2200; and PHY 200L or PHY 2200L.

Basic laws of thermodynamics and their applications to heat-power machinery applied on shipboard heat-power plants, steam and gas turbines, internal combustion engines, and vapor-compression refrigeration systems. 3 lectures. Formerly ET 344 at Cal Maritime.

ET 3350 Electrical Machinery (3 units)
Term Typically Offered: F
Prerequisite: ET 250 or ET 2250, and ET 250L or ET 2250L; or ENG 250 or ENG 2250, and ENG 250L or ENG 2250L. Concurrent: ET 350L or ET 3350L.

Principles and application of magnetic circuits and transformers, three phase power, power factor correction, DC motors and generators, three phase AC motors and alternators, single-phase motors, stepper motors, electronic motor control, and circuit protection devices. 3 lectures. Formerly ET 350 at Cal Maritime.

ET 3350L Electrical Machinery Laboratory (1 unit)
Term Typically Offered: F
Prerequisite: Prerequisite: ET 250 or ET 2250, and ET 250L or ET 2250L; or ENG 250 or ENG 2250, and ENG 250L or ENG 2250L. Concurrent: ET 350 or ET 3350.

Application of the principles from electrical machinery in laboratory measurements and analysis. 1 laboratory. Formerly ET 350L at Cal Maritime.

ET 3370 Electronics (3 units)
Term Typically Offered: SP
Prerequisite: COM 220L or COM 2220L; ET 250 or ET 2250; and ET 250L or 2250L. Concurrent: ET 370L or ET 3370L.

Principles and application of electronic circuits and components, microcontrollers, operational amplifiers, comparators, peak detectors, active filters, timer circuits, AD conversion, serial communication, and micro electro-mechanical systems. 3 lectures. Formerly ET 370 at Cal Maritime.

ET 3370L Electronics Laboratory (1 unit)
Term Typically Offered: SP
Prerequisite: COM 220L or COM 2220L; ET 250 or ET 2250; and ET 250L or 2250L. Concurrent: ET 370 or ET 3370.

Application of the principles from Electronics in laboratory measurements and analysis, followed by a comprehensive team project. 1 laboratory. Formerly ET 370L at Cal Maritime.

ET 4400 Instrumentation and Measurement (3 units)
Term Typically Offered: F
Prerequisite: ET 370 or ET 3370; and ET 370L or ET 3370L. Concurrent: ET 400L or ET 4400L.

Instrumentation devices and their uses in monitoring processes. Instrumentation used for measuring temperature, pressure, level, flow, position and motion as well as other types of analytical measurement are studied. Principles of signal conditioning including op-amp applications, filtering, applications to pneumatic systems, and digital signal conditioning. Relationship to modern data acquisition systems and how to optimize measurements and effectively analyze measured signals. 3 lectures. Formerly ET 400 at Cal Maritime.

ET 4400L Instrumentation and Measurement Laboratory (1 unit)
Term Typically Offered: F
Prerequisite: ET 370 or ET 3370; and ET 370L or ET 3370L. Concurrent: ET 400 or ET 4400.

Lab designed to introduce instrumentation and measurement. Includes studies involving signal conditioning, Wheatstone bridge applications, use of operational amplifiers for signal conditioning, Boolean logic, thermal transducers, strain gage measurements, variable capacitance transducers, and optical transducers. Computer-based data acquisition. 1 laboratory. Formerly ET 400L at Cal Maritime.

ET 4442 Heating, Ventilation, and Air Conditioning (2 units)
Term Typically Offered: F
Prerequisite: ET 342 or ET 3342; and ET 342L or ET 3342L. Concurrent: ET 442L or ET 4442L.

Application of thermodynamics with regard to refrigeration/air conditioning cycle. Focus on the HVAC requirements of facilities with application to ships as well as any facility. Examination of design of HVAC systems, including heat balance, duct design and fan selection. 2 lectures. Formerly ET 442 at Cal Maritime.

ET 4442L Heating, Ventilation, and Air Conditioning Laboratory (1 unit)
Term Typically Offered: F
Prerequisite: ET 342 or ET 3342; and ET 342L or ET 3342L. Concurrent: ET 442 or ET 4442.

Laboratory supporting Heating, Ventilation, and Air Conditioning course. 1 laboratory. Formerly ET 442L at Cal Maritime.

ET 4460 Automation (3 units)
Term Typically Offered: SP
Prerequisite: ET 400 or ET 4400; and ET 400L or ET 4400L. Concurrent: ET 460L or ET 4460L.

Automation in power plants, engineering processes, and manufacturing processes leading to an understanding of modern control systems. Principles of analog and digital control systems as well as measurement methods and final control valves and actuators. PID (proportional plus integral plus derivative) control applications and programmable logic controllers. Investigate modeling, measurement and control of mechanical, thermal, fluid, and electrical systems. 3 lectures. Formerly ET 460 at Cal Maritime.

ET 4460L Automation Laboratory (1 unit)
Term Typically Offered: SP
Prerequisite: ET 400 or ET 4400; and ET 400L or ET 4400L. Concurrent: ET 460 or ET 4460.

Principles introduced and discussed in Automation. Introduction to the concepts of closed loop control, PLC (programmable logic controllers) programming, pneumatic logic and control applications, frequency response in systems (Bode plots), and process loop tuning methods. 1 laboratory. Formerly ET 460L at Cal Maritime.

ET 4470 Engineering Management (3 units)
Term Typically Offered: F
Prerequisite: Junior standing; EGL 220 or EGL 2220.

Introduction to the engineering profession with a focus on total quality management, personnel management, project management, legal concerns, professional liability, and ethics. 3 lectures. Formerly ET 470 at Cal Maritime.

ET 4490 Power Engineering Technology (3 units)
Term Typically Offered: SP
Prerequisite: ET 344 or ET 3344; ET 350 or ET 3350; and ET 350L or ET 3350L. Concurrent: ET 490L or ET 4490L.

Capstone course in engineering technology. Apply the engineering fundamentals of previous thermodynamics and electrical machinery to studies of combustion processes, combustion by-products and emission abatement and electrical distribution and transmissions systems commonly found in modern marine propulsion plants and the power industry. Familiarization with renewable energy resources. Field trip may be required. 3 lectures. Formerly ET 490 at Cal Maritime.

ET 4490L Power Engineering Technology Laboratory (1 unit)
Term Typically Offered: SP
Prerequisite: ET 344 or ET 3344; ET 350 or ET 3350; and ET 350L or ET 3350L. Concurrent: ET 490 or ET 4490.

Perform thermodynamic analyses of operating power generation equipment. 1 laboratory. Formerly ET 490L at Cal Maritime.

FF Courses

FF 1100 Basic Marine Firefighting (0 units)
Term Typically Offered: F, SP
CR/NC

U.S. Coast Guard-approved and STCW-required course consists of 16 hours of lecture and practical skills demonstrations that cover basic marine firefighting skills, including extinguishers, breathing apparatus and live firefighting. Credit/No Credit grading only. Formerly FF 100 at Cal Maritime.

FF 2200 Basic/Advanced Firefighting (0 units)
Term Typically Offered: F, SP
CR/NC

This course is a requirement for all students enrolled in a USCG license program although it is administered by Continuing Maritime Education (CME). Credit/No Credit grading only. Formerly FF 200 at Cal Maritime.

FF 3300 Advanced Marine Firefighting (0 units)
Term Typically Offered: F, SP
CR/NC
Prerequisite: Prerequisite: FF 100 or FF 1100; and one of the following: NAU 205, NAU 2205, ENG 430, or ENG 4430.

U.S. Coast Guard-approved and STCW-required course with a management focus. Consists of 32 hours of lecture and practical skills review that examines firefighting techniques and control of operations, with emphasis on organization, tactics, command functions and shipboard firefighting demonstrations. Credit/No Credit grading. Formerly FF 300 at Cal Maritime.

FPE Courses

FPE 5500 Individual Study (1-4 units)
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Advanced study planned and completed under the direction of a member of the program faculty. Open only to graduate students in the FPE program who have demonstrated ability to do independent work. Repeatable up to 8 units. Formerly FPE 500.

FPE 5501 Fundamental Thermal Sciences (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing.

Introduction to the thermal sciences, including thermodynamics, fluid dynamics and heat transfer, as related to fire protection engineering. Includes 1st and 2nd laws of thermodynamics, conservation relations, hydrostatics, internal and external flows, and heat transfer by conduction, convection and radiation. Course may be offered in classroom-based or online format. 3 lectures. Formerly FPE 501.

FPE 5502 Fire Dynamics and Flammability (4 units)
Term Typically Offered: TBD
Prerequisite: FPE 501 or FPE 5501.

Fundamentals of combustion and fire dynamics. Material and product flammability regulation. Building analysis and assessment of fire hazards based on explicit fire protection engineering goals and objectives. Formulation and technical justification of design fires and analysis of fire protection systems. Course may be offered in classroom-based or online format. 4 lectures. Formerly FPE 502.

FPE 5504 Fire Modeling and Applications (4 units)
Term Typically Offered: SU
Prerequisite: FPE 502 or FPE 5502.

Fire modeling techniques for fire safety assessment. Application of engineering correlations and computer-based fire models, including zone models and computational fluid dynamics models, to representative fire problems. Smoke management principles and systems detailed and analyzed. Course may be offered in classroom-based or online format. 4 lectures. Formerly FPE 504.

FPE 5521 Fire Detection, Alarm and Egress Systems (4 units)
Term Typically Offered: F
Prerequisite: Graduate standing.

Regulatory and performance-based analysis for fire alarm systems and egress systems in buildings. Analysis of performance characteristics of fire detectors. Introduction to methods for calculating people movement and evacuation times, including computer-based evacuation simulation models. Course may be offered in classroom-based or online format. 4 lectures. Formerly FPE 521.

FPE 5523 Fire Suppression Systems (4 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing.

Fire suppression agents, systems and applications. Analysis of automatic sprinkler systems, including water supply analysis and hydraulic calculations. Analysis of special hazard systems, including water spray, water mist, foam, clean agent, carbon dioxide, inert gas, and dry and wet chemical systems. Course may be offered in classroom-based or online format. 4 lectures. Formerly FPE 523.

FPE 5524 Structural Fire Protection (3 units)
Term Typically Offered: SU
Prerequisite: Graduate standing.

Performance analysis procedures and residual capacity calculation methods of structural components under fire-induced thermal exposures. Materials detailed include wood, steel, concrete, and composites. Regulatory and fire resistance requirements and traditional and innovative protection schemes of various building conditions types. Course may be offered in classroom-based or online format. 3 lectures. Formerly FPE 524.

FPE 5551 Fire Risk Analysis (2 units)
Term Typically Offered: F
Prerequisite: Graduate standing.

Fire safety design methodologies including prescriptive and performance-based design with specifics focused on risk-based analysis and connections between design methods. Identification and application of different fire risk management tools and techniques. Course may be offered in classroom-based or online format. 2 lectures. Formerly FPE 551.

FPE 5552 Advanced Modeling in Fire Protection Engineering (2 units)
Term Typically Offered: F
Prerequisite: FPE 504 or FPE 5504.

Advanced concepts encompassing aspects of fire protection engineering including evacuation modeling, fire modeling, and structural fire modeling. Limitations, complexity, and diminishing returns of modeling. Factor of safety selection for Required Safe Egress Time (RSET), Available Safe Egress Time (ASET), and structural integrity time (SIT) based on uncertainty analysis. Course may be offered in classroom-based or online format. 2 lectures.

FPE 5554 Forensic Fire Analysis (2 units)
Term Typically Offered: SP
Prerequisite: Graduate standing. Recommended: FPE 504 or FPE 5504.

Introduction to fire investigation and reconstruction. Engineering analysis of structural and wildland fires. Identification of failure mechanisms in fire safety systems. Case studies of actual fire incidents to address and reinforce concepts related to different types of performance failures. Course may be offered in classroom-based or online format. 2 lectures. Formerly FPE 554.

FPE 5555 Fire Protection Management in the Wildland-Urban Interface (WUI) (2 units)
Term Typically Offered: SP
Prerequisite: Graduate standing.

Technological and social issues affecting fire management in wildland-urban interface landscapes. Factors including the wildland fire environment, suppression, construction, access, prevention and evacuation. Fire risk analysis; needs assessment, legislative codes, standards and policies; incident response planning. Course may be offered in classroom-based or online format. 2 lectures. Formerly FPE 555.

FPE 5570 Special Advanced Topics (2 units)
Term Typically Offered: SP
Prerequisite: Graduate standing and consent of instructor.

Directed group study of special topics for advanced students. The Class Schedule will list topic selected. Repeatable up to 4 units. Course may be offered in classroom-based or online format. 2 lectures. Formerly FPE 570.

FPE 5595 Cooperative Education Experience (1-4 units)
Term Typically Offered: SU
Prerequisite: Consent of instructor.

Curricular Practical Training (CPT) to gain work experience directly related to fire protection engineering. Intended for international students. CPT work authorization is required for all paid or non-paid, part- or full-time employment and internships. Repeatable up to 4 units. Formerly FPE 593.

FPE 5598 Project (1-4 units)
Term Typically Offered: SP
Prerequisite: FPE 504 or FPE 5504 and consent of instructor.

Performance of comprehensive fire and life safety evaluations of buildings and other structures. Communication of the results and findings of such evaluations in written report and by oral presentation to satisfy the culminating experience for a master's degree. Conducted under supervision of faculty. Repeatable up to 4 units. Formerly FPE 596.

FPE 5599 Thesis (1-6 units)
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Each individual will be assigned a thesis project for solution under faculty supervision as a requirement for the master's degree, culminating in a written thesis. Repeatable up to 6 units. Formerly FPE 599.

TEM Courses

TEM 5500 Project Management (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

Manage projects from small to extremely large. Work individually and in teams to experience managing a project, analyze case studies on specific topics in the field, and practice problem solving using the important concepts and methods such as software for scheduling and resource management. Organizing and managing projects. Selection of alternate projects using financial viability, suitability of the end product, time of delivery, and quality as criteria. Defining scope. Scheduling and resource management. Budgeting and control. Ending projects and learning from them for the future. Examples will be drawn from operations such as engineering and supply chains, including a maritime link. Course offered online only. 3 lectures. Formerly TEM 500 at Cal Maritime.

TEM 5510 International Transportation Economics (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

Apply microeconomic principles, especially in the field of freight transportation, with special attention to international transport and maritime related scenarios. Classical and behavioral microeconomic methods and practices are used to illuminate the management of enterprises and assets in transportation markets, as well as in their global settings and in the presence of external influences such as regulation and political and social concerns. Work individually and in teams to analyze case studies on specific topics in the field, and practice issue diagnosis and explanation using the important concepts and methods covered. Modern theories of transport supply and demand, the firm and costs, industrial organization in markets, externalities, regulation, and models of social welfare. Examples will be drawn primarily from freight transportation scenarios, including a maritime link. Course offered online only. 3 lectures. Formerly TEM 510 at Cal Maritime.

TEM 5520 Organizational Behavior and Management (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the Transportation and Engineering Management program.

Explores transitions and trends in the environment of contemporary global business processes and activities. Main focus on the human resources channel of the supply chain, including the primary functions of recruiting, training, and work force maintenance. Within this primary focus, control mechanisms (such as protection of the confidentiality of employee records), labor relations, leadership, organizing, and planning are addressed. Case examples in the maritime and logistics industry will frequently be referenced to enhance course objectives. Course offered online only. 3 lectures. Formerly TEM 520 at Cal Maritime.

TEM 5530 Financial Management (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the Transportation and Engineering Management program.

Concepts in corporate financial management and the decision making for a business enterprise. Financial statement analysis, discounted cash flow valuation, net present value and other capital budgeting criteria, interest rate and bond valuation, stock valuation, risk and return trade-off, capital asset pricing model, cost of capital, efficient market hypothesis, and capital structure. Course offered online only. 3 lectures. Formerly TEM 530 at Cal Maritime.

TEM 5540 Information Systems Management (3 units)
Term Typically Offered: SU
Prerequisite: Admission to the Transportation and Engineering Management program.

Systems analysis principles, and investigation of the structure and operations of large, complex modern computer networks. Survey of the major systems used for decision making and data management in international logistics and engineering oriented concerns. Obtain a working knowledge of the functions and data required for each, and how the pieces fit together into a strategy for getting the right information to the right decision maker at the right time. Special emphasis placed on systems particularly important in transportation, logistics, and maritime related firms, and those important in supply chain command and control. Students also learn how to participate in or lead a system design and implementation project. Course offered online only. 3 lectures. Formerly TEM 540 at Cal Maritime.

TEM 5600 Global Logistics and Supply Chain Management (3 units)
Term Typically Offered: SU
Prerequisite: Admission to the Transportation and Engineering Management program.

Logistics is the science of movement of materials from raw material to the customer in the globalized economy; supply chain management focus on understanding basic techniques and strategic issues in the successful movement of products from their origins as raw materials to their final destinations as finished products, including the impact of culture, strategic planning, organization, and management control. Specific topics may include customer service, e-commerce, facilities location, routing and pricing, storage, transportation, emerging technologies, and re-engineering the supply chain. Emphasis will be placed throughout on the maritime component, with frequent use of case studies. Course offered online only. 3 lectures. Formerly TEM 600 at Cal Maritime.

TEM 5610 International Transportation Law (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

Focused on legal issues in transportation, logistics and supply chain management in the globalized economy. Freight charges liability; loss, damage and delay claims, billing disputes, overcharge and undercharge claims; bills of lading; the freight classification system; cargo insurance; applicable international legal treaties and conventions; and the current state of international transportation law. Course offered online only. 3 lectures. Formerly TEM 610 at Cal Maritime.

TEM 5620 International Trade and Finance (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

Advanced course of study focusing on trade and finance in a globalized economy. Trade topics include the current structure of the international trading system, global trade treaties and agreements, and the impact of e-commerce on traditional trade constructs. Financial topics covered include raising capital in the global economy; the management of investment and exchange risk; and global financial treaties and agreements. Course offered online only. 3 lectures. Formerly TEM 620 at Cal Maritime.

TEM 5630 Port and Terminal Management (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the Transportation and Engineering Management program.

Advanced course of study dealing with modern port and terminal operations, including logistics processes such as on-dock rail, strategic and tactical planning, harbor drayage, terminal gate protocols, equipment and cargo management, and integration of marine port and terminal operations with other modes of transportation. Introduction to several different types of marine terminals, including containerized liner facilities, dry bulk, and liquid bulk facilities, ro-ro terminals, and others. Course offered online only. 3 lectures. Formerly TEM 630 at Cal Maritime.

TEM 5700 Systems Engineering Management (3 units)
Term Typically Offered: SU
Prerequisite: Admission to the Transportation and Engineering Management program.

Systems Engineering Management introduces students to the principles and processes of systems engineering, from concept development through system integration, testing and life cycle support. Explores a disciplined approach to identifying user needs, translating those needs into a complete system specification, and verifying the requirements are met. A team project related to deployment of a large-scale complex system is used to demonstrate the integrated nature of systems engineering. Course offered online only. 3 lectures. Formerly TEM 700 at Cal Maritime.

TEM 5705 Strategic Management (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

Focuses on the managing and resolution of complex problems in engineering management. The process of crafting strategy; evaluating a company's external environment; evaluating a company's resources and competitive position; integration and outsourcing; diversification, acquisitions and new ventures; competing in foreign markets; strategy, ethics, and social responsibility; and effective strategy execution. Course offered online only. 3 lectures. Formerly TEM 705 at Cal Maritime.

TEM 5710 Technology Management and Innovation (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

An advanced course of study focused on the management of technology and innovation in industry. Human: factors; dynamics of technological innovation; formulation and implementation of management strategy; including relevant and current management case studies and simulations designed to increase critical thinking skills while exposing the student to real world scenarios. Course offered online only. 3 lectures. Formerly TEM 710 at Cal Maritime.

TEM 5720 Energy Resource Management (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the Transportation and Engineering Management program.

Focused on energy resource management issues including: Auditing and economic analysis; management control and maintenance systems; sustainability and high performance facilities; alternative energy systems; boilers and fired systems; cogeneration and HVAC systems; lighting and electrical management; natural gas purchasing; utility deregulation and energy systems outsourcing; energy security risk analysis methods; financing energy management projects. Course offered online only. 3 lectures. Formerly TEM 720 at Cal Maritime.

TEM 5800 The Global Humanitarian System (3 units)
Term Typically Offered: SU
Prerequisite: Admission to the Transportation and Engineering Management program.

Consider in greater depth the humanitarian system as a whole and the resulting tensions. Compare and contrast the actions and activities with those found in the commercial and military counterparts that will be found operating alongside the humanitarian logistic network. Focus on the issue of the development and maintenance of inter-personal and inter-organizational trust as a critical success factor within the post-disaster response. Course offered online only. 3 lectures. Formerly TEM 800 at Cal Maritime.

TEM 5810 Rapid and Slow Onset Disaster Management (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

Introduction to the disaster response cycle and a high-level discussion of the key stakeholders. Consider the role of the humanitarian logistician before discussing five of the most significant challenges facing those working in this field. Course offered online only. 3 lectures. Formerly TEM 810 at Cal Maritime.

TEM 5820 Humanitarian Project Management (3 units)
Term Typically Offered: F
Prerequisite: Admission to the Transportation and Engineering Management program.

On the basis that the whole area of the preparation and response to a natural disaster falls into the Rittel and Webber's categorization of a "wicked problem", based on academic approaches to the "taming" of such problems, this course will consider alternate ways of managing the humanitarian logistic challenge. These will be drawn from a number of fields including those of project management and procurement as well as the area of general management. Course offered online only. 3 lectures. Formerly TEM 820 at Cal Maritime.

TEM 5830 National and International Humanitarian Logistics (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the Transportation and Engineering Management program.

Recognize that there are significant differences in the philosophical approach, and consequential policies, processes and procedures adopted by different countries in their preparation and response to national and international disasters. Consider the differences in such approach, the implications for international cooperation and the extent to which best practice can be synthesized. Course offered online only. 3 lectures. Formerly TEM 830 at Cal Maritime.

TEM 5900 Capstone (3 units)
Term Typically Offered: SP
Prerequisite: Admission to the Transportation and Engineering Management program.

Scope, develop, plan, and execute an in-depth practical project to deliver value in global transportation and/or engineering management, usually for an organization familiar to them. Work in consultation with the course instructor, and usually other faculty and other representatives in a committee selected by the student and instructor. Using knowledge acquired in the program, they devise and present workable solutions to improve some aspects of management and operations in the global business or humanitarian climate of today for their target enterprise. May be taken as a capstone course in a semester, or as a masters' thesis over a longer period, which is appropriate for projects that require more in-depth research and which may yield publishable results. No thesis may take more than six calendar months from its start. A project or thesis is a significant undertaking appropriate to the professional field of supply chain management. It evidences originality and independent thinking, appropriate form and organization, and a rationale. Describes and summarizes it in a written document that includes the project's significance, objectives, methodology and a conclusion or recommendation. Oral presentation in defense of the project to his committee, and possibly to the public. Course offered online only. 3 lectures. Formerly TEM 900 at Cal Maritime.