

HAROLD ALFOND SCHOOL OF ENGINEERING

# ENGINEERING TECHNOLOGY & OPERATIONS

## B.S. DEGREES

**Marine Engineering Operations\***  
**Marine Engineering Technology\***  
**Power Engineering Operations**  
**Power Engineering Technology**

## PROGRAMS OVERVIEW

If you are interested in how the world around you works or if you have ideas on how to improve the tools, appliances, and machines we use, you already have the qualities needed to become an outstanding engineer. As an engineer you'll be faced with significant and rewarding challenges such as taking charge of the controls, finding and fixing problems, or working to create new and better products. Not only will you learn to meet these challenges at Maine Maritime Academy, you will practice on real equipment, bringing theory to life.

### Marine Engineering Operations (MEO)\*

This major forms the foundation of all programs within the Engineering Department. You will learn to operate the power-generation, electrical, hydraulic, and many other engineering systems of a floating vessel. Although you'll train to be a specialist in marine engineering operations, you'll find that this major allows you ample flexibility to work in areas such as off-shore oil exploration, shoreside power generation, or business.

### Marine Engineering Technology (MET)\*

This major incorporates many courses from the MEO program, with additional courses in science, mathematics, communications, technical science, and laboratory testing methods. Students entering this major are interested in

working at sea with the option of becoming a shore-based technologist. The Marine Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org>.

### Power Engineering Operations (PEO)

This non-seagoing major is concerned primarily with the operation and maintenance of industrial steam and gas turbine power plants and with related electrical systems. Your classroom studies are closely coordinated with practical experience in laboratories. Successful completion of the program leads to the Bachelor of Science degree and, after passing a State of Maine examination, a 4th-Class Stationary Engineer's license.

### Power Engineering Technology (PET)

This non-seagoing major includes most MEO courses, plus study of shoreside power plant operations and management. Your career opportunities as a power engineering technologist lie in utility power plants, biomass operations, and cogeneration systems. The Power Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org>.

*\* This major leads to a U.S. Coast Guard engineering license and requires participation in the Maine Maritime Academy Regiment of Midshipmen.*

## SEA TIME AND CO-OP TRAINING

All candidates seeking a 3rd Assistant Engineer license from the U.S. Coast Guard are required to complete approximately 195 days of training at sea. Sea time is accomplished through specialized laboratories, simulation, and three distinct training cruises. Majors impacted by this training requirement include:

*Marine Engineering Operations (MEO)*  
*Marine Engineering Technology (MET)*

**Training Cruises:** At the conclusion of the first and third years, students gain sea experience aboard the college's Training Ship *State of Maine*. Typically scheduled in the summer months, training cruises often include four domestic or foreign ports of call. Designed to develop practical skills required of a licensed seafaring officer, cruise activities directly involve students in the operation and maintenance of the ship. Regardless of your major, the first cruise provides an overall orientation to both the deck and engineering aspects of a ship's operation. The training cruise experience at the conclusion of the third year focuses on engineering training, watches, and maintenance.

**Cadet Shipping:** The second cruise experience, completed at the conclusion of the second year, will place you aboard a commercial merchant ship, tanker, bulk carrier, container ship, or cruise liner. A vital element of your undergraduate education, this summertime

Cadet Shipping experience immerses you in this dynamic industry, giving you a chance to test your knowledge, learn from professional seafaring officers, and see the world.

**Co-ops:** PEO and PET students gain hands-on training in summer cooperative work experiences in power plants and large industrial settings nationwide.

## HANDS-ON OPPORTUNITIES

At MMA, a typical day on the path to becoming competent, well-rounded engineers and engineering technologists is packed with exciting classes involving hands-on lab work, high-tech training, and stimulating classroom discussion.

### Academic Activities:

- A Computer-Aided Drafting (CAD) project that produces engineering drawings of several machine parts
- Work in the Machine Tool Laboratory using lathes to manufacture a valve stem
- Non-Destructive Testing (NDT) on welds that students have prepared in the welding laboratory

### High-Tech, On-Campus Labs:

- Small-Scale Operating Steam Plant
- 1,200-hp Diesel Engine
- Power Plant Simulator
- Machine Tool Lab
- Welding and Testing Lab
- Control Room Simulator (Diesel Power)
- Electrical Power Lab
- 500-foot Training Ship *State of Maine*

## DYNAMIC CAREERS

Professional engineering careers encompass a wide variety of jobs, offering many opportunities and excellent pay, world-wide. Some recent graduates have taken on dynamic positions such as:

- **Operating Engineers** on ocean going ships or in land-based electrical generation facilities
- **Power Brokers** controlling the supply and distribution of electricity for the world's largest entertainment complex, involving the purchase and sale of millions of dollars worth of electricity annually
- **Technical Operators**
- **Engineers**
- **Field Service Engineers**
- **Project Engineers**

## ENGINEERING AND TECHNOLOGY

What are some of the differences between engineers and engineering technologists?

### *Engineers design and develop technology:*

Your role as an engineer begins with the most basic instructions and requirements: improve the fuel efficiency of this engine, develop an appliance that stabilizes a boat in rough seas, design a toaster that heats evenly. Compared to the courses of an engineering technology student, an engineer prepares for the demands of this career by taking more design, systems, analysis, math, and science courses.

### *Engineering technologists test and operate technology:*

Engineering technologists work with products that have been designed and fine-tuned by engineers. Your job as an engineering technologist is to integrate and operate the often complicated systems — hydraulic, electrical, power-generation — these machines rely upon to run. You must thoroughly understand each system and its fundamentals in order to test products for safety and endurance. You are responsible for recognizing operating problems, inefficiencies, and potential breakdown. Moreover, you must be comfortable troubleshooting and repairing complex systems. Compared to the courses of an engineering student, an engineering technology student prepares for the demands of this career by taking fewer math and science courses; more lab, and application of machines and devices courses.



## STUDENTS LIKE YOU

Outside of class, Maine Maritime engineering students enjoy intercollegiate conferences and professional networking as part of the MMA student chapters of the American Society of Mechanical Engineers, the Society of Naval Architects and Marine Engineers, and the Association for Facilities Engineering. Group activities have included a gravity-powered car design and performance contest, tutoring in local schools, and field trips to major industrial settings.

## PROFESSIONAL CREDENTIALS

Successful completion of requirements in each of the engineering majors offered at MMA leads to potential professional licensing opportunities.

### Marine Engineering Operations

- USCG 3rd Assistant Engineer License, Unlimited Horsepower, Steam or Motor, Any Ocean
- Eligible to sit for State of Maine 3rd Class Engineer License (Stationary Plant) *Note: eligibility requires providing evidence of applicable steam plant operating experience.*
- Students who complete the required Eg431 Gas Turbines course with a 70% or higher grade are required to take the USCG Unlimited Gas Turbines License exam module and score at least a 70% to earn the unlimited Gas Turbines endorsement on their USCG Unlimited Engineer License.

### Marine Engineering Technology

- USCG 3rd Assistant Engineer License, Unlimited Horsepower, Steam or Motor, Any Ocean
- Eligible to sit for State of Maine 3rd Class Engineer License (Stationary Plant) *Note: eligibility requires providing evidence of applicable steam plant operating experience.*
- Eligible to sit for Fundamentals of Engineering Exam

### Power Engineering Operations

- Eligible to sit for State of Maine 4th Class Engineer License (Stationary Plant)

### Power Engineering Technology

- Eligible to sit for State of Maine 3rd Class Engineer License (Stationary Plant) *Note: eligibility requires providing evidence of applicable steam plant operating experience.*
- Eligible to sit for Fundamentals of Engineering Exam

## LEARN MORE

Visit [mainemaritime.edu](http://mainemaritime.edu) for helpful information on all aspects of Maine Maritime Academy academics, student life and admissions. Admissions counselors are always available to speak with you — simply give us a call. Our online catalog is regularly updated and should be referred to for complete programming.