

Massachusetts Maritime Academy – Department of Marine Engineering  
Internal Combustion Engine LAB I EN-2232L-41/45/91/95  
Spring 2025

Instructor: Jon Behm

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Office Hours: Monday, 0900-1100 and Tuesday, 1300-1400, or by appointment

Prerequisites:

- Engineering Systems and Safety
- Internal Combustion engine class ongoing simultaneously.

Entrance Requirements

- Demonstrate a basic understanding of hand tools.
- Understand the construction, operation, and function of small diesel engines.

Texts:

LAB manual given to cadets during the first lab.

COVID-19:

If we must move to an online learning format, all material will be presented via Blackboard. The course will switch to a blend of synchronous and asynchronous methods. An updated syllabus will be provided.

Caution:

- Cell phones will be taken and given to the Dean. Students are expected to bring notebooks and writing utensils.
- No food or drink is allowed in the lab except bottled water.
- All COVID-19 protocols and policies will be followed if necessary.
- If required as the semester progresses, you must always wear a mask that covers your nose and mouth in the lab.

Course Description:

EN -1232L lays the foundation for future engineering courses. Students will learn the basic principles of construction, operation, maintenance, and repair of internal combustion engines. Topics include identification of components. Cylinder head removal and re-installation. Setting valve lash. Removal of pistons and connecting rods then re-installing. Fuel injector testing. Fuel pump inspection. Honing and measuring cylinder liners. Operation of the Main Engines and Generators on the training vessel Ranger. Operation of lifeboat engines on the Patriot State.

Attendance:

- Attendance is mandatory for all lab instruction. Special liberties DO NOT COUNT as an excused absence.
- Lab instruction classes are Mandatory. Disciplinary action will be taken if needed. An “Incomplete” grade will be issued if all labs are not completed by the end of the Spring 2025 semester.

Grading:

Labs consist of 10% of your grade in ICE 1. This consists of Attendance and Participation	
Lab	10%

### Note:

This is an STCW-required course; the only grades earned in this class will be “A, B, C, or F.” The lowest passing grade is a C-. If you have below a 70, you will fail the course and have to repeat the course.

### Dress Code:

All regimental cadets are required to be in boiler suits for the lab, however, they must be clean and with no holes. If you are not in the proper uniform, you will be asked to leave, which will count as an absence.

### Honesty:

Students are expected to be honest and forthright in their academic endeavors. Academic dishonesty includes cheating, inventing false information or citations, plagiarism, computer tampering, destroying other people’s studio property, or academic misconduct. Plagiarism and cheating are not permitted. Students caught cheating will receive a zero for the assignment and may receive a failing grade for the entire course.

### Class Policy:

Respect for your classmates and the instructor is paramount. You may be dismissed from the lab for any behaviors considered as distractions, including, but not limited to:

- Arriving late to lab or leaving the lab without permission from the instructor
- Performing a repetitive act that is annoying or loud or having prolonged side conversations
- Providing inappropriate comments to the instructor or classmates
- Not turning off or muting your cellphone may cause phone rings, beeps, vibrations, etc.
- Sleeping, reading a newspaper, browsing social media, or using your phone for anything (including text messaging) at any time during class

The instructor initially, either generally or individually, as part of the instructor’s classroom management efforts will address any distracting behavior. Cases in which such annoying behavior becomes excessive and the student refuses to respond to the faculty member’s efforts will be referred to the registrar, academic advisor, Department Chair, and maybe to the Academic Dean, and you may be dismissed from class – even if it is during an exam.

### Blackboard:

Blackboard will enhance the overall course content. It will be used to upload lectures, handouts, and videos. You are responsible for checking your Blackboard for material and ensuring you can log in. Homework will also be turned in and passed out on Blackboard, and online quizzes will be available.

### Homework:

Homework will be assigned and used to prepare cadets for quizzes. All assignments must be turned in on the due dates, with no exceptions. Late or illegible homework will not be accepted and will be graded as a zero. Not all homework will be returned to the students.

### Quizzes:

Topic material for exams/quizzes comes from the course textbook, lectures, labs, handouts, and material posted on Blackboard. Quizzes will be given each week. The instructor reserves the right to prioritize topic material, reading assignments, the number of tests, and test dates. You must take the quiz on the assigned date.

### Disability Accommodation:

Massachusetts Maritime Academy is committed to providing academic accommodations to students who qualify. Students with an IEP or 504 Plan in high school or others who believe they may need and qualify for accommodations in this class are encouraged to contact Dr. S. Elaine Craghead, Assistant Dean and Academic Accessibility Services Coordinator, ideally within the first two weeks of class. Please remember that academic accommodations are not retroactive. Dr. Craghead can be contacted at [ADAcompliance@maritime.edu](mailto:ADAcompliance@maritime.edu) or x5350.

### Mental Health:

If you feel overwhelmed or worried about a friend, don't hesitate to contact me or your academic advisor. We can try to help or put you in touch with someone who can. Mass Maritime Academy has trained counselors who are available to listen and help.

Academic Integrity, Academic Freedom, and Building Trust in the Lab:

**This commitment to building respect and trust in the classroom means members of this class will not record, photograph, or share any interactions involving classmates or any teaching team member online.** Students will also respect the instructor's intellectual property rights. They will not share or otherwise make accessible any course materials to anyone not enrolled in the course without the instructor's written permission.

This policy is not meant to restrict students' ability to use classroom recordings in ways that are beneficial to their learning. Students who may benefit from recorded lectures and lecture playback, including those who use English as an additional language or who have accommodations from SDS, should speak to the instructor to maintain transparency and trust in the classroom. Students approved to record lectures are expected to respect and preserve the privacy of the learning environment, as stated above.

Students will also not enable anyone not enrolled in the course to participate in any activity that is associated with the course.

Exceptions to this require the instructor's written permission.

Circulating Class Materials:

All course materials are copyrighted, and it is prohibited to circulate or sell to commercial vendors the course materials, including syllabus, exams, lecture notes, images, presentations, and student papers. Such unauthorized behavior constitutes academic misconduct. Video and/or audio recording of class lectures and review sessions without my permission in advance is prohibited. If you have an accommodation letter from Student Disability Services, please make an appointment to meet during office hours before you record anything.

Readings: Will be given out and amended as the course moves along

**Lab 1:** Cylinder head removal/re-installation of Detroit 3-71

**Lab 2:** Cylinder head removal/re-installation of Westerbeke 4-107

**Lab 3:** Piston and Connecting rod removal/re-installation of Detroit 3-71

**Lab 4:** Piston and Connecting rod removal/re-installation of Westerbeke 4-107

**Lab 5:** Fuel injector testing

**Lab 6:** Fuel pump disassembly and assembly

**Lab 7:** Cylinder liner honing and measuring

**Lab 8:** Start and Stop TS Ranger Main Engine and Generator, lifeboat engines on TS Patriot State

Student Learning Outcomes:

Success in this course will be measured by participation and learning the basic operation and assembly/disassembly of small diesel engines.

STCW Learning Objectives:

**Demonstrate knowledge and understanding of the following STCW elements:**

- [OICEW-A4.1](#) *Basic construction and operation principles of marine diesel engines*
- [OICEW-A4.2](#) *Safety and emergency procedures for operation of propulsion plant machinery*
- [ABE-A5.1](#) *Basic knowledge of the function of main propulsion machinery*
- [ABE-A5.1](#) *Basic knowledge of the operation of main propulsion machinery*

Learning Objectives:

The course supports the achievement of the following ABET objectives:

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to identify, formulate, and solve engineering problems
- An ability to communicate effectively, correctly start and operate a diesel engine
- Correctly maintain and repair diesel engines.

- Troubleshoot operational problems
- Identify the engine components and use the correct terminology

Student/Instructor Responsibilities:

Instructor will:

- Arrive on time, prepared for lab
- Maintain student hours
- Treat students with respect
- Grade all quizzes promptly
- Inform students of any changes to the syllabus

Students will:

- Check email and Blackboard daily
- Arrive on time for class, prepared
- Treat all classmates with respect
- Reach out to the instructor with concerns or questions

Note:

This syllabus is subject to change. Students will be notified if anything changes in the syllabus throughout the course.