

COURSE: ICE I EN-2232 Spring 2016

INSTRUCTOR: LCDR Todd Hibbert Office: Room C210A Harrington
Phone/Email: Ext. 2014 thibbert@maritime.edu
Office Hours: Mon. 3rd Period, Wed. 3rd Period,
Fri. 3rd Period

TEXT: Marine Diesel Engines,
Author: Daniel Charnews
Pounder's Marine Diesel Engines,
Author: Doug Woodyard

COURSE INFORMATION

DESCRIPTION: This course lays the foundation for future engineering courses. Students will learn the basic principles of construction, operation, maintenance and repair of both 2 stroke and 4 stroke diesel engines of slow, medium and high speed.

This is a required course for **ALL** marine engineering students and contains STCW knowledge and practical elements. The grade of "C-" or better is required.

PREREQUISITE: Algebra/Trig

Learning Objectives

Demonstrate knowledge and understanding of the following STCW elements:

- AB-E-A5.1 Basic knowledge of the function of main propulsion machinery
- AB-E-A5.1 Basic knowledge of the operation of main propulsion machinery
- 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

Other Objectives

- Correctly start and operate a diesel engine
- Correctly maintain and repair diesel engines.
- Troubleshoot operational problems
- Calculate the indicated horse power
- Identify the engine components and use the correct terminology

GRADING: Quizzes (30%), Midterm (30%), Final (40%).

ATTENDANCE: There will be **NO** quiz make-ups. For each *unexcused* absence there will be a 1% deduction from the final course average. Labs are mandatory and any missed labs will result in an "F" for the course. **Everyone** will take the final on the scheduled day.

NOTE: No Programmable Calculators or Cell Phones allowed during classroom or test time.

MMA is committed to providing reasonable accommodations to students with documented disabilities. Students who believe they may need accommodations in this class are required to contact Fran

Tishkevich, Director of Disability Compliance, within the first two weeks of class at ext. 2208 or by email ftishkevich@maritime.edu

TOPICS/ASSIGNMENTS

READING

- | | |
|---|--------------------|
| 1. Introduction to the Diesel Engine | Chapters 1 and 2 |
| 2. Operating Principles, 2 and 4 Stroke | Chapter 3 |
| 3. Efficiencies and Losses | Chapter 4 and 5 |
| 4. Diesel Power Plants | Chapter 18 |
| 5. Construction and Terminology | Chapters 15 |
| 6. Bedplates and Construction | Chapter 30 |
| 7. Combustion and Emissions | Chapter 12 |
| 8. Maintenance and Repairs | Chapter 32 |
| 9. Air Supply Systems | Chapter 6 |
| 10. Fuels and Fuel Injection System | Chapter 11, 12, 15 |

EN-2232
Lab Schedule

Lab 1

Westerbeke 4-107, cylinder head removal and replacement, with emphasis on valves, head construction, valve lash setting.

Lab 2

Detroit 4-53, cylinder head removal and replacement, with emphasis on valves, head construction, valve lash setting.

Lab 3

Group A: Westerbeke: Fuel and fuel injection, fuel purging, injector testing.

Group B: HP fuel pump port and helix metering.

Groups switch at the 2 hour mark to complete the 4 hour lab.

Lab 4

Group A: Detroit: Compression test and tune up.

Group B: Cylinder liner honing, measurements piston measurements.

Groups switch at the 2 hour mark to complete the 4 hour lab.

Lab 5

Group A: Wartsila parts identification.

Group B: T.S. Kennedy lifeboat engine parts identification, startup and shutdown.

Groups switch at the 2 hour mark to complete the 4 hour lab.

Lab 6

Westerbeke 4-107 or Detroit 4-53: Complete engine tear down on either with liner, piston removal and valve lash setting.

*Note cadets will only do one engine.

EN 2232 LAB POLICIES

1. You must attend **6, four period labs**, every other week. See Lab schedule for attendance days. **SHOW UP EARLY.**
2. Eye protection **MUST** be worn. **NO ELASTIC BAND** goggles.
3. Steel toe shoes **MUST** be worn.
4. Tools will **NOT** be stored in the Lab.
5. The student must sign in and have their Lab handout signed before leaving.
6. **Each student is responsible for cleaning** the engine they worked on and any other assignments from the Instructor. The student must not leave the Lab until properly dismissed.

Course: Internal Combustion Engines-I

Department of Engineering
Internal Combustion Engines- I EN-2232
Spring 2016

INSTRUCTOR: Lt. Donald Trudeau
Office: Harrington 212A
Phone: ext. 2081
Email: dtrudeau@maritime.edu
Office hours: Monday, Wednesday, Friday 2nd period

TEXT: Handouts
Diesel Engineering Handbook, Karl Stinson

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PREREQUISITE: Algebra/Trig

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- AB-E-A5.1 Basic knowledge of the function of main propulsion machinery
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- 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

Other Objectives

- Correctly start and operate a diesel engine
- Correctly maintain and repair diesel engines.
- Troubleshoot operational problems
- Calculate the indicated horse power
- Identify the engine components and use the correct terminology

GRADING: Quizzes (60%), Class Participation (10%), Labs (10%), Final (20%).

ATTENDANCE: There will be **NO** quiz make-ups. For each *unexcused* absence there will be a 2% deduction from the final course average. Labs are mandatory and any missed labs will result in an "F" for the course. **For those that have perfect attendance their lowest quiz grade will be dropped.**

Uniform: **No boiler suits allowed in class**, only uniform of the day. Only long sleeve boiler suits allowed in lab (no short sleeves)