

Engineering Systems and Safety EN-1112L

Fall 2022

Instructor: LCDR Gill

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Office Hours: Wednesdays, 1300 to 1500 hrs., Thursday, 1200 You must email me first to schedule a meeting

Prerequisites:

None

Awareness:

- If a cell phone is seen in class, it will be taken and given to the Undergraduate Dean.
- Students are expected to bring notebooks and writing utensils.
- Programmable calculators are not allowed during quizzes and exams.
- Cell phones may not be used as a calculator.
- Once lab starts, if a cadet leaves the lab, he/she will not be allowed back into the lab.
- COVID-19: It is expected that all MMA cadets/students comply with updated MMA Policies and Protocols

Lab Description: Breshnahan Bldg. Rm 144 and the Wilkinson Lab

Students are required to attend all labs. Students who fail to make all labs will fail the course. Engineering System and Safety lab is broken up into four groups A, B, C and D that rotate between Engine Labs either in the Breshnahan Bldg. rm 144 or the Wilkinson lab and OSHA dedicated classroom. Each Engine Lab section will meet 6 times over 12 weeks. It is each student's responsibility to be on time to lab and to bring all required PPE. There is a possibility of this changing due to classroom availability. First meeting all students will meet on the Parade Field, right in front of the Breshnahan Bldg..

Required PPE:

All students shall be in a boiler suit, clean with no rips and with a name tag. You must have some form of ID Hard Hat, Eye Protection, Hearing Protection, Long sleeve boiler suit, steel-toe boots, flashlight that is working, and gloves are required PPE.

Attendance:

- Lab instruction classes are Mandatory. Disciplinary action will be taken if needed. An "Incomplete" grade will be issued if all labs are not completed.
- Labs meet every week. You are required to bring proper PPE to all Labs.

Grading: Engine Lab constitutes 10% of Engineering Systems and Safety Grade

- You will be given an online Wiper's Exam at the end of Engine labs.
- Exam material will come from Engine Labs,

- lab classroom,
- Engineering Lab manual Pictures of Equipment and Safety items aboard the TS Kennedy will be shown during labs and the locations of these discussed.
- Labs:

All Engineering Labs must be attended and completed to the satisfaction of the lab instructors to receive a final grade in this course. You must show up with all your PPE.

If You miss an in-person labs cannot be made up nor incompletes given as a result of missed labs. If you miss a lab(s), your course grade will be impacted and may result in a Incomplete grade; and you may be advised to withdraw from the course. You are required to read all the chapters in your Engine Lab Manual pertaining to the TS Kennedy.

### Topics:

#### **OSHA Lab**

1. Brief introduction to OSHA
2. Electrical, general, safety related work practices 1910.331 - 335
3. Lockout/Tagout Procedures 1910.147
4. Personal Protective Equipment, Subpart I, 1910.132 - 138
5. Respiratory Protection, 1910.134
6. Hearing Protection, 1910.195
7. Confined Spaces, 1910.146
8. Hazard Communication 1910.1200 (Material Safety Data Sheets)
9. Bloodborne Pathogens, 1910.1030
10. Emergency Action Plans, Fire Prevention, from 1910 Subparts E and L
11. Fall Protection – 1926.502 General, guardrails, fall arrest systems
12. Hand and portable power tools, general, 1910 Subpart P
13. Machine Guarding, general, 1910 Subpart O

#### **Engine Lab**

1. TS Kennedy Engineering Engine Escapes, ship Safety, discussion of Steam Cycle
2. Hand Tools
3. Wilkinson Lab PID Drawing
4. TS Kennedy Lube Oil and Fuel Oil Service Systems.
5. Dockside Cut-Away Boiler
6. Diesel Engines

### Student Learning Outcomes:

Success in this lab will be measured through a Wiper's Exam

### Learning Objectives:

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

- **BFA-X1.1** Assessment of needs of casualties and threats to own safety
- **BFA-X1.2** Appreciation of body structure and functions
- **BFA-X1.3** Position casualty
- **BFA-X1.3** Apply resuscitation techniques
- **BFA-X1.3** Control bleeding
- **BFA-X1.3** Apply appropriate measures of basic shock management

- **BFA-X1.3** Apply appropriate measures in event of burns and scalds, including accidents caused by electric current
- **BFA-X1.3** Rescue and transport a casualty
- **BFA-X1.3** Improvise bandages and use materials in the emergency kit
- **OICNW-C8.3** Knowledge of elementary first aid
- **OICEW-D8.3** Knowledge of elementary first aid
- **SCRB-X5.1** Use of the first-aid kit and resuscitation techniques
- **SCRB-X5.2** Management of injured persons, including control of bleeding and shock

#### COURSE OUTCOMES:

1. Identify OSHA's history and regulations.
2. Identify electrical hazards and prevent electrical injuries.
3. Recite the importance of Lock-Out Tag-Out procedures and practices.
4. Choose, wear, and care for proper PPE.
5. Determine the need for a hearing conservation plan and don and doff hearing protection.
6. Identify a confined space.
7. Explain the need for a permit to enter a permit-required confined space and the potential hazards that are present in a confined space/permit-required confined space.
8. Recite the components of hazard communication and identify hazard warning labels.
9. Identify workplace BBP hazards, exposures, proper personal protection, and engineering controls. Students will also understand medical requirements of a BBP exposure.
10. List the components of an Emergency Action/Fire Prevention Plan, identify the various roles of individuals during an emergency as well as the importance of reviewing, revising, and implementing a plan.
11. Describe the various types of fall protection and when fall protection is required.
12. Recognize potential hazards with hand and portable power tools, how to inspect tools, inspection frequency, and how to work safely.
13. Identify the types of machine guards, how to inspect, when and who may remove guards, and what to do if a guard is missing.

#### STCW Learning Objectives:

- **AB-E-C4.1** Personal safety equipment
- **OICEW-C1.5** Safety measures to be taken to ensure a safe working environment
- **OICEW-D8.4** Knowledge of personal safety
- **OICNW-C8.4** Knowledge of personal safety
- **PS-SR-X3.1** Importance of adhering to safe working practices at all times
- **PS-SR-X3.2** Safety and protective devices available to protect against potential hazards aboard ship
- **RFPEW-A1.3** Safe working practices as related to engine-room operations
- **RFPEW-A3.2** Know escape routes from machinery spaces