

Massachusetts Maritime Academy
Auxiliary Machinery I (EN-1211)
Spring 2016

- **Instructor:** Lt. Roger Gill, Assistant Professor (MMA)
- **Office:** Harrington Building, Room 217A
- **Telephone and e-mail:** (Ext. 1707) rgill@maritime.edu
- **Office Hours:** Mon., Weds, Fri. 5th Period (12:00-12:50)

- **Cell Phones MUST be turned off and NO TEXTING during class!**
- **Textbooks:**
- **Introductory to Steam Engineering:** EN-1111 Notes
- **Auxiliary Machinery, U.S. Department of Energy** EN-1211
- **Auxiliary Machinery I Study Guide**
- **Engineering Training Manual (TS Kennedy/Enterprise)**

- **Website:** web.maritime.edu Go to USCG License Exam Preparation, then MEWB Test Generator (7th Edition) and (6th Edition). Also, go to STCW Training Videos
- **Uniform and Dress Code:** Cadets are expected to be in the proper uniform of the day as announced by the Commandant of Cadets Department. **NO BOILER SUITS!**

- **NO electronic devices** may be used in during exams EXCEPT a non-data-transmitting calculator. Calculators MAY NOT be shared during an exam. Any infringement from this policy will constitute cheating and will be treated as such in accordance with regimental manual/academic policies.

- **Course Description:** Auxiliary Machinery I is a (3.5) credit course that lays the foundation for future engineering courses. Students will learn the basic principles of construction, operation, maintenance and repair of auxiliary machinery systems. Topics include pipe and fittings: valves, pumps and heat exchangers; pressure, temperature, level and flow measurement; piping and instrument diagrams (P & ID) and blueprint reading. Both shore-side and marine applications are discussed. This is a required course for all engineering students and contains STCW knowledge and practical elements. **A grade of C- or better is required to pass.**

- **Standard in Training, Certification, and Watchkeeping (STCW)** Auxiliary Machinery I is an STCW Course. STCW policy requires a passing grade of 70 or higher for any STCW course. The STCW course grading will be A, B, C, C- or F. No "D" grading policy. You will Pass or Fail. Failing will require Auxiliary Machinery I again.

- **Prerequisites:** Engineering Systems and Safety (EN-1112); Intermediate Algebra (SM-0112)

- **Course Objective:** Auxiliary Machinery I prepares the student in the fundamentals of operation, maintenance and repair of auxiliary machinery systems. Knowledge of the construction and purpose of system components is paramount. Emphasis is placed on safety and the specific engineering topics and systems discussed.

- **Learning Objectives:** At the completion of the course, the student should be able to:
 - Demonstrate knowledge and understanding of the following STCW elements:
 - AB-E-A5.1 Basic knowledge of the function of auxiliary machinery
 - AB-E-A5.1 Basic knowledge of the operation of auxiliary machinery
 - AB-E-A6.1 Knowledge of oil transfer operations
 - AB-E-A6.1 Preparations for fuelling and transfer operations
 - AB-E-A6.1 Procedures for connecting and disconnecting fuelling and transfer hoses
 - AB-E-A6.1 Procedures relating to incidents that may arise during fuelling or transferring operation
 - AB-E-A6.1 Procedures for securing from fuelling and transfer operations
 - AB-E-A8.1 Safe operation of valves and pumps
 - AB-E-B1.1 Ability to use lubrication materials and equipment
 - OICEW-A4.1 Basic construction and operation principles of pumps
 - OICEW-A4.1 Basic construction and operation principles of heat exchanges
 - OICEW-A5.2 Operation of pumping systems
 - OICEW-A5.2 Routine pumping operations
 - OICEW-C1.7 Use of various types of sealants and packings

- OICEW-C2.2 Appropriate basic mechanical knowledge and skills
- OICEW-C2.5 Design characteristics and selection of materials in construction of equipment
- OICEW-C2.6 Interpretation of machinery drawings and handbooks
- **Demonstrate proficiency in the following skills:**
- ABE-1-6A Assist with fuel oil transfer
- **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
- **ATTENDANCE:** Attendance is mandatory for class lectures and lab instruction. Daily Attendance will be taken. TWO (2) Points will be deducted from your Final grade for each class missed. . If you miss a class, for any reason, you are responsible for all lessons and assignments. **All medical/illness absences must be accompanied by a signed Medical document upon return to class.** You must attend your assigned class, no "switching" to an earlier class. You must take exams on scheduled dates, confirmed by me. If, due to a MMA sporting event/activity, in which the Dean acknowledges your absence, you must immediately schedule with me the appropriate time to make-up this exam/Quiz, after which taken, the class exams will be returned.
- **Sleeping in class:** Any student sleeping during any part of my class will be dismissed from class. This will be considered an absence from class with (2) points deducted from the Final Grade Point average.
- **Special Liberty Policy:** Please do not ask the Instructor to sign a special liberty request. The only special liberties recognized by the engineering department are those of an emergency nature which are granted directly by the Commandant of Cadets office.
- **Notebooks:** Students are expected to maintain a three-ring notebook for the course materials.
- **Grading Policy:**
- Quizzes = 25%
- Mid-Term = 25%
- Final Exam= 30%
- Homework=10%
- Labs= 10%
- **Homework:** Homework assignments will be given during class. The Homework assignment topic matter, along with "Safety" topic matter, will be on exams. Homework must be passed in by 1600 hour of the due date given in class to be eligible for a 100% grade. Any homework delivered after 1600 hour of the due date will be eligible for a maximum of 70% grade. I will not accept any homework (2) days past the due date.
- **Examination Material:** There will be weekly quizzes, a Mid-term exam and a Final Exam. If a quiz needs to be rescheduled, the new quiz date and subject material will be announced in class. Material for exams/quizzes will come from subject matter covered in class, the TS Kennedy, required reading assignments, handouts, homework, labs, safety and USCG questions from the web.maritime website. All written and drawn test answers must be neat or no credit will be given. If topic/subject materials are to be changed, for any quiz/exam, I will announce the changes to the class.
- **Dates and Topics:** **REQUIRED READING ASSIGNMENTS**
- **SAFETY** Topic material will come from class, lab, Introduction to Steam Engineering Ch. 9, TS Kennedy, OSHA, and will be discussed in various classes.
- 3/2/16
- LotoHandout
- Engineering Terms.....Handout
- Steam Cycle.....Review
- 3/4/16
- Steam Cycle including Thermodynamic principles.....Introduction to Steam Engineering Ch. 1 and 2
DOE Handbook pp. 9-30
- TS Kennedy Emergency, Abandon Ship, Fire, Lifeboat and Safety Procedures.
- 3/7/16
- Steam Tables.....Introduction to Steam Engineering pp 157-160
- Piping and Instrumentation Diagrams (P&ID).....DOE Handbook pp. 121-176
- 3/9/16
- Piping Instrumentation Diagrams (P&ID).....DOE Handbook pp.121-176
- HOMEWORK #1 is DUE

3/11/16 QUIZ No. (ONE)

- After Quiz, Topic is P & ID Topic/Pressure Scales
- Pressure scales, conversion factors.....Auxiliary Machinery I Study Guide pp 73-95.
And basic measuring instruments.....DOE Handbook pp 59- 71

3/14/16

- Pressure scales, conversion factors.....Auxiliary Machinery I Study Guide pp 73-95.
And basic measuring instruments.....DOE Handbook pp 59- 71

3/16/16.

- Pressure scales, conversion factors.....Auxiliary Machinery I Study Guide pp 73-95.
And basic measuring instrumentsDOE Handbook pp 59- 71
- Fasteners and Hardware.....Auxiliary Machinery I Study Guide pp. 9-18

3/18/16 QUIZ No. (TWO)

- After Quiz, Topic is Pressure and Measurements /Fasteners and Hardware/Level Measurements

3/21/16

- Level MeasurementsDOE Handbook pp 72-88
- Temperature Scales, conversion factors.....DOE Handbook pp 43-71
and basic measuring instruments.....Auxiliary Machinery I Study Guide pp 61-71

3/23/16

- Temperature Scales, conversion factors.....DOE Handbook pp 43-71
and basic measuring instrumentsAuxiliary Machinery I Study Guide pp 61-71
- Homework #2 is DUE
- Safety.....TBA

3/25/16 QUIZ No. (THREE).

- After Quiz, Topic is Temperature/Pipe Tubing

3/28/16

- Temperature Scales, conversion factors.....DOE Handbook pp 43-71
And basic measuring instrumentsAuxiliary Machinery I Study Guide pp 61-71
- Pipe/Tubing.....Auxiliary Machinery I Study Guide pp. 105-116

3/30/16

- Pipe/Tubing.....Auxiliary Machinery I Study Guide pp. 105-116

4/1/16 QUIZ NO. (FOUR)

- After Quiz, Topic is Pipe

4/4/16

- Pipe/Tubing Identification and Materials.....Auxiliary Machinery I Study Guide pp. 117-120
- Pipe/Tubing Connection Methods.....Auxiliary Machinery I Study Guide 121-137

4/6/16

- Pipefitting/Tubing ToolsAuxiliary Machinery I Study Guide pp. 44-60
- Pipe/Tubing Connection Methods.....Auxiliary Machinery I Study Guide 121-137
- Piping Problems.....Auxiliary Machinery I Study Guide 138-145

- Homework # 3 is DUE

4/8/16 QUIZ No. (FIVE)

- After Quiz, Topic is Piping Problems/Steam Traps

4/11/16

- Piping Problems.....Auxiliary Machinery I Study Guide 138-145
- Steam traps.....DOE Handbook pp 251-255.
Auxiliary Machinery I Study Guide pp 159-172
- Valves Types, Parts and Functions.....DOE Handbook pp. 201-250, 394-400
Auxiliary Machinery I Study Guide pp 187-243

MID-TERM EXAM 4/13/16 (WEDNESDAY)

- EXAM INCLUDES ALL MATERIAL UP TO THIS POINT; Class Work, Homework, Labs, Safety, Reading Assignments
- Will Review When ALL Grades are entered and Exam is returned to you

4/20/16

- Valves Types, Parts and Functions.....DOE Handbook pp. 201-250, 394-400
Auxiliary Machinery I Study Guide pp 187-243
- Packing and GasketsAuxiliary Machinery I Study Guide pp 173-185
- Homework # 4 is DUE

- 4/22/16 QUIZ No. (Six)
- After Quiz, Topic is Valves, Packing and Gaskets
- 4/25/16
- Regulating Valves-Spring Loaded.....Auxiliary Machinery I Study Guide pp 219-231
(Including Reducing Valves)
- 4/27/16
- Regulating Valves-Spring Loaded.....Auxiliary Machinery I Study Guide pp 219-231
(Including Reducing Valves)
- Regulating Valves-Air Operated..... Auxiliary Machinery I Study Guide pp. 233-243
- 4/29/16 QUIZ No. (Seven)
- After Quiz, Topic is Air Valves and Valve Actuators
- Regulating Valves-Air Operated.....Auxiliary Machinery I Study Guide pp. 233-243
- Valve Actuators.....DOE pp. 244-250
- 5/2/16
- Regulating Valves-Air Operated.....Auxiliary Machinery I Study Guide pp. 233-243
- Relief and Safety Valves.....DOE pp. 240-242
Auxiliary Machinery I Study Guide pp. 200-202
- 5/4/16
- Relief and Safety Valves.....DOE pp. 240-242
Auxiliary Machinery I Study Guide pp. 200-202
- Heat Exchangers.....DOE Handbook pp 293-310
- Strainers.....DOE Handbook pp. 256-264
Auxiliary Machinery I Study Guide pp. 147-157
- Homework #5 is DUE
- 5/6/16 QUIZ NO. (Eight)
- After Quiz, Topic is Heat Exchangers/Strainers
- Heat Exchangers.....DOE Handbook pp 293-310
- Strainers.....DOE Handbook pp. 256-264
Auxiliary Machinery I Study Guide pp. 147-157
- 5/9/16
- Heat Exchangers.....DOE Handbook pp 293-310
- 5/11/16
- Non-Positive Displacement Pumps.....DOE Handbook pp 265-281
Auxiliary Machinery I Study Guide pp 249-275
- 5/13/16 QUIZ No. (NINE)
- After Quiz, Topic is Pumps
- 5/16/16
- Non-Positive Displacement Pumps.....DOE Handbook pp 265-281
Auxiliary Machinery I Study Guide pp 249-275
- Positive Displacement Pumps..... DOE Handbook pp. 282-292
- 5/18/16
- Positive Displacement Pumps.....DOE Handbook pp. 282-292
- 5/20/16 QUIZ NO. (TEN)
- After quiz, Topic will be Process Control
- 5/23/16
- Process Control.....DOE Handbook pp 341-393
- 5/25/16
- Process Control.....DOE Handbook pp 341-393
- Bunkering and Bunkering SafetyClass Discussion
- 5/27/16Quiz No. (Eleven)
- After Quiz, Topic will be Bunkering and Fuel Oil Transfer
- 5/31/16
- Fuel Oil Transfer

- 6/1/16
- Measuring Tools.....Auxiliary Machinery I Study Guide pp 19-30
- Torque Wrenches..... Auxiliary Machinery I Study Guide pg. 37

- 6/3/16 Quiz No. (Twelve)after Quiz Topic is
- Measuring Tools.....Auxiliary Machinery I Study Guide pp 19-30
- Torque Wrenches..... Auxiliary Machinery I Study Guide pg. 37
- Wrenches
- Safety
- 6/6/16: REVIEW

- Textbook pages may vary with recent editions.
- LABS:
- Labs will meet in Breshnahan Rm 126 or where the Lab Instructor designates. Bring lab handouts, given in class, with you. All labs must be completed to the satisfaction of the lab instructor. Any lab missed will cause the final grade to be issued as an "INCOMPLETE." There are no make-up labs at the end of the semester. If you miss a lab, YOU are responsible to make it up

- Lab Attire: Wear PPE; Long-sleeve Boiler Suit, Hard Hat, Steel-Toed Boots, Hearing Protection, Flashlight, gloves..
- Bring (3) Ring Binder and Pen/Pencil and calculator.

- Learning Disabilities: MMA is committed to providing reasonable accommodations to students with documented disabilities. Students who believe they need accommodations in this class are required to contact Mr. Fran Tishkevich, Acting director of Disability Compliance, the first day of class at ext 2208 or by e-mail at ftishkevich@maritime.edu

- *MMA Health Services realizes that students may encounter situations which could impede their academic, personal and social development and success. Counseling services are designed to help students address these concerns, increase their self-awareness and empower them to manage challenging areas in their lives. To schedule a confidential appointment please email Jlevesque@maritime.edu or call ext. 1480.