COURSE: **ELECTRONICS** **EN-3212** **Spring 2022**

INSTRUCTOR: Dr. Diane DiMassa ddimassa@maritime.edu HA-215 ext. 5119
Office Hours: MWF 0900-1000

TEXTS:

ZyBook: EN3212: Electronics

1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: MARITIMEEN3212DiMassaWinter2022
3. Subscribe

Other Resources:

allaboutcircuits.com
Practical Ninjas YouTube Channel

PRE-REQUISITES: Engine Physics II (SM2224), Calculus II (SM2113)
Electronics provides a broad overview of the modern electronics used by the marine and power industries for automation, system monitoring and control. The course gives the foundations of both analog and digital circuits.

OBJECTIVES:

- Understand the relationship of component blocks and signals in electronic systems.
- Define and analyze primary circuits and components used for analog signal conditioning.
- Define primary and analyze circuits and components used for digital signal conditioning.
- Read analog and digital circuit diagrams, and identify basic electronic components.
- Understand the use of solid-state devices for amplification and switching applications.
- Analyze op-amp circuits.
- Design and analyze logic gate schematics.
- Convert between binary, decimal, and hexadecimal numbering systems.
- Read and understand PLC and ladder logic diagrams used in discrete-state applications.

Demonstrate knowledge and understanding of the following STCW elements:

- OICEW-B1.2 Configuration and operation principles of electronic equipment
- OICEW-B1.2 Characteristics of basic electronic circuit elements
- OICEW-B2.6 The interpretation of electrical and simple electronic diagrams

ATTENDANCE: Attendance is mandatory. Any student with more than five (5) unexcused absences will fail the course. For an absence to be excused, the student must 1) notify me *IN ADVANCE*, and 2) provide written documentation justifying the absence. ***Both criteria must be satisfied for the absence to be excused. Having watch is NOT a valid excuse for missing class.***

ELECTRONICS IS AN STCW KNOWLEDGE COURSE: All engineers must earn a C- or better to pass the course.

POLICIES:

The occasional lecture will be taught online.

Visits to the head should take place between classes, not during class.

Make sure your cell phone is OFF during class.

GRADING: Note: Grading policy is subject to change and will be explained in class.

ZyBook Activities	15%
Homework	10%
Quizzes (4)	50%
Final Exam	25%

ACADEMIC INTEGRITY:

I remind you that your goal in college and the reason you or your parents are paying for your education is ***to learn as much as you can***, not to get high grades. Cheating defeats this purpose. Electronics is a foundational course and the information herein is pertinent to all methods of automation and control of engineering systems. Furthermore, it's simply not fair to the students who work hard and try their best that some cheater gets higher grades and knows less.

We have an Honor Code at MMA:

Massachusetts Maritime Academy cadets and students do not lie, cheat, or steal nor do they tolerate these acts from others.

Take it seriously. To be perfectly clear, in this class it is OK to study with classmates and work together on homework problems, but any work submitted under your own name, must be your own work based on your understanding -- not copied or cribbed from someone else. For exams, cheating includes using any resource except paper, pencil, approved calculator and what's in your head, unless it has been specifically provided by or expressly allowed by the instructor. Cheating also includes communicating with others during the exam and viewing others answers.

DISABILITIES: Students with documented disabilities will be afforded appropriate accommodations. Students entitled to additional time on exams must make arrangements with me in advance. Students who believe they may need accommodations in this class are required to contact the Director of Disability Compliance *within the first two weeks of class*.

TOPICS: Review of Physics II - Resistor Networks and DC Circuit Analysis
Voltage Dividers, Transfer Functions, Gain
Maximum Power Transfer Theorem, Impedance and Wheatstone Bridge
Superposition and Thevenin Equivalents
AC Signals, Capacitors and Rectifiers
Filters
Diodes and Transistors
Operational Amplifiers
Control Systems and Converters
Introduction to Digital Systems
Boolean Algebra and Logic Gates and
Advanced Logic Circuits
PLCs and Ladder Logic