

**Fall 2022 EN-3212 Electronics Syllabus**  
**Department of Engineering**  
**Massachusetts Maritime Academy**

**Instructor:** Dr. Wei Yu

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**Office Hours:** MF 900am - 950am, W 1300pm - 1350pm or by appointment.

**Office Location:** Harrington Building, 209A

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**Class Schedule:** MWF, 1000am - 1050am

**Class Location:** Bresnahan Building, 222

**Textbooks:**

- Electronics Fundamentals: Circuits, Devices and Applications (8th edition), Thomas L. Floyd, David M. Buchla, Pearson, 2010
- Foundations of Analog and Digital Electronic Circuits, Agarwal & Lang, Elsevier, 2005 (eBook)
- Programmable Logic Controllers (5th edition), Frank Petruzella, McGraw Hill, 2017

**Prerequisites:** SM-2224 Engineering Physics II

**Course Description:** Theory of basic solid-state electron devices. Power circuits. Use of analog and digital integrated circuits in control systems for logic, interlocks, and automated machinery control.

**Course Learning Objectives:**

- Understand the relationship of component blocks and signals in electronics systems
- Define and analyze primary circuits and components used for analog signal conditioning
- Define and analyze primary 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

**STCW Learning Objectives:**

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

**Grading Policy:** Electronics is an STCW required course. A minimum course grade of C-(70%) is required for STCW credit and to pass the course. The course grade is calculated based on the following weights:

Homework	10%
Quizzes(× 4)	40% (10% each)
Tests (× 2)	30% (15% each)
Final Exam	20%

Letter grade is typically assigned with respect to total percentages earned based upon the standard described in the catalog.

(93% - 100%, A; 90% - 92%, A-; 87% - 89%, B+; 83% - 86%, B; 80% - 82%, B-; 77% - 79%, C+; 73% - 76%, C; 70% - 72%, C-; 0% - 69%, F.)

Homework 10%: Each homework assignment should be submitted by the given due date and time. The late submission gets a 10% penalty for each late day. Any homework submitted one week after the due date gets no credit. Late submission is only accepted if the homework solution is not posted online or given in class. Once the homework solution is posted online or given in class, any submission afterward gets no credit without prior authorization from the instructor.

Quizzes 40%: There are 4 quizzes and each quiz's grade counts as 10% of the course grade. The date of each quiz will be announced in class.

Tests 30%: There are 2 tests and each test's grade counts as 15% of the course grade. Tentative test dates:

Test#1: Wednesday, Oct 12, 2022

Test#2: Wednesday, Nov 16, 2022

Change to any test date, if necessary, will be announced in class in advance.

Final Exam 20%: There is one comprehensive exam that will be given during the final exam week.

**Attendance Policy:** You are permitted to have ONE unexcused absence without penalty. Each additional unexcused absence results in a two-point reduction from the course grade. FIVE unexcused absences, including the first no penalty excuse, automatically results in a failure in the course. Five minutes late of a class or early leave of a class without prior authorization is also considered as an unexcused absence.

Any unexcused absence from a quiz, a test or an exam automatically results in a zero in the quiz, the test or the exam. In order to obtain an excused absence or prior authorization from the instructor, you must,

1. notify the instructor in advance of the absence,
2. provide written documents to justify your absence.

Both of the criteria must be satisfied to obtain an excused absence or prior authorization. Having watch is NOT a valid absence excuse. For any excused absence from a quiz, a test or an exam, only one time makeup will be arranged. There is no second makeup if you miss the first makeup again. The makeup of a quiz, a test or an exam is not the same as the original one.

The uniforms should be worn in class. Boiler suits are not allowed. No food or drink is allowed in class. Please use restroom before or after class but not in the middle of class to avoid class interruption.

**Academic Dishonesty:** All work submitted in this course must be your own and produced exclusively for this course. The use of sources (ideas, quotations, paraphrases) must be properly acknowledged and documented. When the instructor has concerns about potential violation of the

Honor Code, the instructor may pursue the alleged violation with the Commandant of Cadets. In serious cases, violations of the honor code may result in dismissal from the Academy. If you are in doubt regarding any aspect of these issues as they pertain to this course, please speak with the instructor.

Taking and using the writing, ideas or work of another person and passing it in as your own work is considered as plagiarism. If you are not sure if you are plagiarizing, you can always check with the instructor in advance. Some of the most common forms of plagiarism are:

- Turning in another student's work as your own with or without the student's knowledge
- Turning in work that another student, friend, family member, etc. has written for you

**Cell Phones:** Cell phones and other similar electronic devices are to be silenced and stored out of sight in class.

**Calculators:** Calculators on cell phones are not allowed in quiz, test and exam. Only calculators approved by NCEES (National Council of Examiners for Engineering and Surveying) are allowed. (See: [https://ncees.org/Exams/Examday\\_policies/Calculator\\_policy.php](https://ncees.org/Exams/Examday_policies/Calculator_policy.php))

**Students with Disabilities:** The Academy offers, upon request, accommodations to students with documented learning disabilities. The ADA Coordinator, Asst. Dean Elaine Craghead, evaluates the documentation provided, determines appropriate services, and is available to discuss accommodations with students. The Disability Resources office is located in the Academic Resource Center, ABSIC 320. Students can drop in during normal business hours, M-F 0800-1600, or call x5120, or email [ADAcompliance@maritime.edu](mailto:ADAcompliance@maritime.edu).

**Tentative List of Topics to Be Covered:**

Week	Dates	Lecture Topics
1	9/6 - 9/9	Introduction, Ohm's Law
2	9/12 - 9/16	Series Circuits, Parallel Circuits
3	9/19 - 9/23	Series-Parallel Circuits, Wheatstone Bridge
4	9/26 - 9/30	Superposition, Thevenin Equivalents
5	10/3 - 10/7	AC, Capacitors
6	10/10 - 10/14	Diodes, Rectifiers ( <b>Test 1</b> )
7	10/17 - 10/21	Transistors
8	10/24 - 10/28	Filters
9	10/31 - 11/4	Filters
10	11/7 - 11/11	Operational Amplifiers
11	11/14 - 11/18	Operational Amplifiers ( <b>Test 2</b> )
12	11/21 - 11/25	Numbering Systems, Boolean Algebra
13	11/28 - 12/2	Logic Gates
14	12/5 - 12/9	PLCs
15	12/12 - 12/14	Review
		<b>Final Exam</b>