

Electronics – Physics 440/540
Spring 2019
SUNY College at Cortland
Physics Department

Catalog Description

440: A survey of D.C. and A.C. circuits, semiconductor devices and electronic test equipment.

540: Exploration of AC and DC circuits from experimental and theoretical perspectives. Topics include: measurement and diagnostic devices, resistive and reactive networks, transformers, and semiconductor devices such as diodes, photovoltaic cells and transistors.

Required Texts

- *Introduction to Mechatronics* (5th Ed.) by David Alciatore and Michael Hstand ISBN:978-1-260-04870-4.

Instructor Information

Instructor: Douglas Armstead

Office: 127 Bowers (607) 753-2919

Office Hours: W 4-5pm, TR 2:30-3:30pm

Course Website: <http://facultyweb.cortland.edu/douglas.armstead/S18/Electronics.html>

Email: douglas.armstead@cortland.edu

Lecture meets: Tuesday 4:25-pm-6pm in 1113 Bowers.

Lab meets: Thursday 4:25-7:15pm in 1113 Bowers.

Expectations

What you should expect from me:

- Explanations of physical concepts that include concrete examples and, where reasonable, demonstrations.

- In-class examples that help you to develop the level of reasoning that is necessary to do the problems you will encounter in the homework and on exams.
- Careful and respectful consideration of your questions.
- An open door policy—if my office door is open you should feel free to come in and talk about physics. This is in addition to my regularly scheduled office hours listed above.

What I expect of you:

- Your presence in class, both physical and mental, for the entire class period.
- To prepare for class. This includes doing the reading at a level that you arrive with questions in hand about the material.
- When you have a question, ask it. Your fellow classmates will thank you—if you are unclear on something, chances are the person next to you is, too.
- Submit work for grading that is your own. If you copy from another student or source and submit it for a grade, then you risk receiving an F in the course.

Grades

The final score for the class is found in the following way:

$$score = \frac{H + L + E_1 + E_2 + F}{5} \quad (1)$$

H =homework average, L =laboratories, $E_i = i$ th exam, and F =final exam or project.

The homework is a vehicle for your mastering the concepts, techniques, and thought processes relevant to Electronics and for communicating this in a way that leads from beginning to end using a clear, methodical plan. There are a number of aids at your disposal: the book, the instructor, in and out of class; and your classmates. But in the end nothing beats quiet concentration and gradually sorting things out for yourself.

Some homework will involve spice simulation and you should think of those simulations as an important part of the solution but that a full solution includes an explanation of your results.

Homework will typically be assigned on Tuesday and due on the following Tuesday, when solutions will be provided. Allowing late homework is not really in your best interest and will generally not be accepted.

The lab is where you will bring the ideas in class to life. Synthesizing what was important, useful, dangerous, etc. is an important part of a lab. I will not be looking for formal lab reports but I will be looking for documents that point out the key things in complete sentences using data, graphs, calculations, etc. to ground your argument.

As an alternative to the final exam you can create an electronics project that makes use of three key pieces: at least one sensor, at least one actuator, at least one programable microcontroller to do a useful task. You will need to present your project to the class.

Make-up exams will only be administered for “Excused Absences” (see University Catalog for details). Supporting documentation to excuse your absence will be required.

The score is mapped into a grade roughly as:

Final %	Grade
90-100	As
80-89	Bs
70-79	Cs etc.

Improvement and class participation may be used raise a border line grade.

Academic Integrity

You are expected to observe the University's statements and procedures on Academic Integrity in the college handbook, Chapter 340. Ask me if you have any uncertainty about what it means to cheat or the distinction between proper collaboration and plagerism.

Students with a Disability

If you are a student with a disability and wish to request accomodations, please contact the office of Student Disability Services located in VanHoesen B-1 or call (607) 753-2066 for an appointment. Information regarding your disability will be treated in a confidential manner. Because requests for accommodation take time to review and many accommodations require early planning, requests for accommodations should be made as early as possible.

Class Schedule

All dates are tentative.

Week	Chapter(s)	Topic
1/29	1&2	Overview and Components
2/5	2	Components
2/12	3	Semiconductors
2/19	3	Semiconductors
2/26	4	AC response
3/5		Exam 1 on 3/5.
3/12	4	AC response
3/19		Spring Break
3/26	5	OpAmps
4/5	5	OpAmps
4/12		Exam2 on 4/12.
4/19	6	Digital Circuits
4/26	7	Microcontrollers
4/30	7&10	Microcontrollers and Actuators
5/7	10	Actuators

Final Exam at 4-6pm on Tuesday May 14, 2019