

PHY 202: Principles of Physics II (Fall 2020, CRN 91321)

Instructor: Dr. Eric Edlund

SUNY Cortland, Physics Department

NOTE: These policies are subject to change if our circumstances change.

Course Meeting Times

Lecture: MWF 11:30 AM – 12:20 PM
Recitation: cancelled

Standing Office Hours

Monday 3:00 PM – 4:30 PM
Wednesday 3:00 PM – 4:30 PM
Thursday 2:00 PM – 4:00 PM

Contact Info

Email: eric.edlund@cortland.edu
Phone: 753-5697
Office: Bowers 133

Preferred contact method is email.

Or by appointment:

If you are unable to attend these standing office hours or would like to speak privately about a specific matter, you are encouraged to make an appointment.

I can also do office hours on Teams.

Mask and Social Distancing Policy

This class will be taught in person, both in lecture and in lab. This means that you **MUST** wear a mask to class, and when visiting me in office hours. While in class you must abide by social distancing guidelines to the best of your ability. Failure to act responsibly in these ways will result in being asked to leave the premises. A second offense is grounds for academic misconduct.

How we will operate this class

As much as possible I will try to use a flipped-classroom model where I provide you with reading and video assignments that focus on theory outside of class and we use the lecture time to work problems together. Success requires that you participate and prepare before attending class.

Tools for online meeting and coordination

We will use Microsoft Teams for our online collaborations as much as possible (we may need to use Bb for grades). Use access code **5ncfawn** to join the team for this class, called **PHY 202 - Fall 2020**. You should download the desktop app instead of using the browser-based app. Within Teams we will also be using the **Piazza** app for forum discussions. We will be using the Arduino development environment (<https://www.arduino.cc/en/main/software>) for computer programming, and you can either download the IDE or use the browser-based environment.

My Expectations

Physics 202 builds on concepts from Physics 201 and uses the methods of calculus. Success in this course requires that we be comfortable with core physics concepts such as kinematic relationships, force, energy, momentum, and rotation and be adept at calculating derivatives and integrals, especially of polynomial and exponential functions, together with associated techniques such as the chain rule, u-substitution, and integration by parts. To earn a grade of A or B in this course, you will need to attend class, complete the homework yourself (no Chegg), and prepare for active participation in lecture by learning the theory through watching videos and reading. I expect that you may need to watch/read about the theory multiple times to understand the concepts.

Important Dates

Friday 9/4	End of the add/drop period
Week of 11/2-11/6	Midterm Exams (via online discussion)
Tuesday 5/15	Final Exam, 11:00 AM – 1:00 PM

Course Schedule

Note that this is a tentative schedule and is subject to change as necessary.

Week	Dates	Topic	Chapter	P-Set
1	8/31 to 9/4	Review of PHY201	1-7	#1
2	9/7 to 9/10	Universal Law of Gravitation	8	#2
3	9/14 to 9/17	Electric force & charge	20	#3
4	9/21 to 9/24	Gauss's Law	21	#4
5	9/28 to 10/2	Electric potential	22	#5
6	10/5 to 10/9	Electrostatic energy and capacitors	23	#6
7	10/12 to 10/16	Electric current & DC circuits	24	#7
8	10/19 to 10/23	Electric circuits (resistors)	25	#8
9	10/26 to 10/30	Electric circuits (resistors & capacitors)	25	#9
10	11/2 to 11/6	Review – MIDTERM EXAM	NA	-
11	11/9 to 11/13	Magnetic fields	26	#10
12	11/16 to 11/20	Electromagnetic induction	27	#11
13	11/23 to 11/27	Thanksgiving break – no class	28	#12
14	11/30 to 12/4	AC circuits (online classes)	28	#13
15	12/7 to 12/11	Electromagnetic waves (online classes)	29	
16	12/14 to 12/18	Final Exam on Dec. 15 (Tues), 11:00 AM		

Note: This course will include Chapter 8 (universal law of gravitation) as a starting point for this course since it was not covered in the prior semester.

The final column lists the problem set that will be assigned that week. You will have one week to complete problem sets. Though there will not be a mandatory problem set associated with Chapter 29 (from week 15 of the course), material from this chapter will appear on the final.

This course covers 11 chapters from the textbook at a pace of about 1.5 sections per day, on average. Your regular attendance at class and attention to the readings is essential to your success in this course.

Course Catalog Description

Fundamental principles of electricity and magnetism using methods of calculus. Topics include static electricity, currents and simple circuits, electric and magnetic fields, energy and magnetic materials.

Scope of Course

This is the second course in a series of three introductory, calculus-based physics courses. The subject matter of this course will be roughly divided into three sections:

Part I: electric field & potential, Gauss's Law

Part II: voltage, current & circuits

Part III: magnetic fields

This course has a prerequisite of PHY 201, and a pre-requisite or co-requisite of MAT 122/236 (Calculus B/II). This means that you must have completed Calculus A/I before taking this course.

Required Materials

1. *University Physics 3rd Edition* by Wolfson (you do ****NOT**** need Mastering Physics)
2. A bound notebook (i.e. not loose-leaf or a 3-ring binder) for lab reports
3. Arduino student lab kit, \$65.43 at the SUNY Cortland bookstore

Student Learning Outcomes

Upon successful completion of this course students will be able to:

- know and apply the core principles of physics, such as Newton's laws of motion and the work-energy theorem, among others, to solve a wide range of problems;
- describe a physical system in terms of its electro-magnetic properties such as charge, electric field, electric potential, magnetic dipole moment, magnetic field, among others;
- know and be able to state principles of conservation of energy and momentum as they apply to electro-magnetic systems;
- calculate the trajectories, forces, trajectories, and other dynamical variables associated with motion of charges in electric and magnetic fields;
- conduct experiments related to electro-magnetic systems, including the construction & testing of electric circuits and the writing & debugging of computer code.

Assessment Weighting

Lab Reports	25%
Homework	15%
Quizzes	20%
Midterm	20%
Final Exam	20%

Course Grade Scale

	76.7% ≤ C+ ≤ 79.9%
93.4% ≤ A	73.4% ≤ C ≤ 76.7%
90.0% ≤ A- ≤ 93.3%	70.0% ≤ C- ≤ 73.3%
86.7% ≤ B+ ≤ 89.9%	66.7% ≤ D+ ≤ 69.9%
83.4% ≤ B ≤ 86.6%	63.4% ≤ D ≤ 66.6%
80.0% ≤ B- ≤ 83.3%	60.0% ≤ D- ≤ 63.3%
	E ≤ 59.9%

Course Policies

Note that these policies are subject to change if the circumstances regarding the operation of this course changes due to factors outside my control.

Attendance: Attendance in lab is mandatory. Each unexcused absence in lab will incur a 5% penalty to your course grade. If you have made prior arrangements for remote learning then you are exempt from this.

Lab Reports: You will conduct 7 labs, for which a complete lab report is required. Incomplete, not submitted, or unacceptable lab reports will incur a penalty of 10% to your course grade. Late lab reports will be marked with a 50% penalty.

Forum Discussions: We will be using the Piazza app, located within the Microsoft Teams space, to communicate about this class. You are expected to use this forum to ask questions about HW, labs, and other aspects of our class. Other than emails concerning matters of a personal nature, I will not use email to respond to questions of a general nature or about HW, etc.

Homework: Your homework is your practice for the exams, so you are expected to take it seriously and abstain from using services like Chegg, which only serves to hurt your understanding and performance on the exams. If you do use Chegg (or any other service/source) then you must cite it in your work. Failure to do so is grounds for an academic misconduct violation. You are encouraged to collaborate with your peers as long as the submitted work is your own.

Quizzes & Exams: You will have weekly (approximately) quizzes. You will also have a midterm exam and a comprehensive final exam. You will not be permitted to use the restroom or leave the room during any exam, so please take care of all personal matters before the exams begin. Exams will be closed-book: no notes, books, calculators or other aids will be allowed. No late exams will be permitted without a valid reason, as outlined in the university catalog.

Laboratory kits

Each of you will need to purchase an Arduino student kit, either through the SUNY Cortland Bookstore or from an online source. We will be using this for labs this semester, which will also serve as a backup plan should we need to go fully online.

The cost of these kits is \$65.43 at the bookstore. Given that the focus of these kits is to control a small device called an Arduino, we will necessarily be learning how to do computer programming. To do this we will need to use a special piece of software, which is free, called the Arduino Interactive Development Environment (IDE). You can find this at arduino.cc.

GE Category 2 Learning Outcomes

1. An understanding of the methods of science.
2. Knowledge of the principles of physics.
3. The ability to apply scientific data, concepts, models, and technology to modern life.

The required 5 pages of written text (total) will be completed in your lab reports.

SUNY Cortland Policies and Statements

Academic Integrity Statement: All students are expected to uphold academic integrity standards. Plagiarism is defined as taking the ideas of others and using them as one's own without due credit. Students who cheat in examinations, course assignments, or plagiarize in this course may be disciplined in accordance with university rules and regulations. SUNY Cortland College Handbook, Chapter 340.

Disability Statement: As part of SUNY Cortland's commitment to a diverse, equitable, and inclusive environment, we strive to provide students with equal access to all courses. If you believe you will require accommodations in this course, please place a request with the Disability Resources Office at disability.resources@cortland.edu or call 607-753-2967. Please note that accommodations are generally not provided retroactively so timely contact with the Disability Resources Office is important. All students should consider meeting with their course instructor who may be helpful in other ways. SUNY Cortland College Handbook, Chapter 745.

Diversity Statement: SUNY Cortland is dedicated to the premise that every individual is important in a unique way and contributes to the overall quality of the institution. We define diversity broadly to include all aspects of human difference. The College is committed to inclusion, equity, and access and thus committed to creating and sustaining a climate that is equitable, respectful and free from prejudice for students, faculty and staff. We value diversity in the learning environment and know that it enhances our ability to inspire students to learn, lead and serve in a changing world. We are committed to promoting a diverse and inclusive campus through the recruitment and retention of faculty, staff and students. As a community, we hold important the democracy of ideas, tempered by a commitment to free speech and the standards of inquiry and debate. To this end, we are dedicated to developing and sustaining a learning environment where it is safe to explore our differences and celebrate the richness inherent in our pluralistic society. SUNY Cortland College Handbook, Chapter 130.

Inclusive Learning Environment Statement: SUNY Cortland is committed to a diverse, equitable and inclusive environment. The course instructor honors this commitment and respects and values differences. All students enrolled in this course are expected to be considerate of others, promote a collaborative and supportive educational environment, and demonstrate respect for individuals with regard to ability or disability, age, ethnicity, gender, gender identity/expression, race, religion, sex, sexual orientation, socio-economic status or other aspects of identity. In an environment that fosters inclusion, students have the opportunity to bring their various identities into conversation as they find helpful, but are not expected to represent or speak for an entire group of people who share aspects of an identity. If you have any questions or concerns about this statement, contact the Institutional Equity and Inclusion Office at 607-753-2263. <http://www2.cortland.edu/about/diversity/>

Title IX Statement: Title IX, when combined with New York Human Rights Law and the New York Education Law 129-B, prohibits discrimination, harassment and violence based on sex, gender, gender identity/expression, and/or sexual orientation in the education setting. The federal Clery Act and NY Education Law 129-B provide certain rights and responsibilities after an incident of sexual or interpersonal violence. When a violation occurs, victims and survivors are eligible for campus and community resources. Where the College has jurisdiction, it may investigate and take action in accordance with College policy. If you or someone you know wishes to report discrimination based in sex, gender, gender identity/expression, and/or sexual orientation, or wishes to report sexual harassment, sexual violence, stalking or relationship violence, please contact the Title IX Coordinator at 607-753-4550, or visit <http://www2.cortland.edu/titleix> to learn about all reporting options and resources.

Updated by SUNY Legal on February 1, 2018.