

Phys 212: General Physics Electricity and Magnetism – FA – 2019

Instructor Prof. Louis Leblond

Phone 814-865-5233

Email: lul29@psu.edu

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Course Description:

Calculus-based introduction to classical electricity and magnetism, including such topics as, electric charge and electric fields, Gauss's law, electric potential, capacitance, current, resistance, and circuits, magnetic fields, and fields due to currents, induction and inductance, magnetism of matter, Maxwell's equations, and electromagnetic oscillations

Course Prerequisites

Math 140, Phys 211

Concurrent: MATH 141

Course Topics:

The general topics of Phys 212 are

1. Electric force and field
2. Electric potential and current
3. DC circuits
4. Magnetism
5. Electromagnetic Induction
6. AC circuits
7. Electromagnetic waves

A detailed list of course objectives can be found at the end of this document.

Required Material and Websites:

The course main website is Canvas is <https://psu.instructure.com/>.

The text for this course is **Physics for Scientists and Engineers: A Strategic Approach by Knight, 4th edition**. This course will cover (in parts) chapters 22-32 and Chap 16 from the Phys 211 book.

The soft-cover PSU custom “split” with these chapters, available at the world campus bookstore, also contains access to the MasteringPhysics homework system we will be using in the course. In addition, you are also required to buy or rent the **IOLab device** which we will use

to do hands-on lab from anywhere (this is absolutely necessary to do the labs) and the **PASCO EM-8675 Desktop Electricity Kit**.

Important websites are

1. World campus bookstore to buy custom textbook that comes with access to MasteringPhysics and to buy the iOLab and Electricity Kit. Ship fast anywhere in the world.

https://bookstore.mbsdirect.net/vbm/vb_home.php?FVCUSNO=30113&url=psude.htm

2. Macmillan. You can buy or rent the iOLab from them directly. This is a bit cheaper but shipping may be more expensive and slower.

<https://www.macmillanlearning.com/college/us/digital/iolab>

It is very important that you buy (or rent) the equipment/textbook quickly. You can get a 14 days free access to MasteringPhysics but after that you need to pay and the access code that comes with the special custom book is the best deal for textbook + access to MasteringPhysics.

Failure to get the lab equipment on time for the first lab will result in a zero on each labs that you missed. Failure to do any of the labs will result in your grade lowered to a D at the end of the semester irrespective of your performance in other parts of the class. This is a lab course and the labs cannot be simply skipped.

Structure of the class:

This is a 4 credit course that is fairly intensive with course work due almost every day. A standard week contains three phases: exploratory phase, problem solving phase and revision phase. The exploratory phase of a giving week overlaps with the revision phase of the previous week. The final assignment for a week are due on Tuesday of the next week allowing time to review and discuss.

<i>Days</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>	<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>
	Exploratory Phase		Problem-solving phase		Revision Phase Start Exploratory Phase for next week		
<i>Graded assignments due</i>	Discussion boards – first post	Reading quiz		Tutorial/Lab first draft	Discussion boards – Replies	Peer-reviews	Tutorial/Lab final version Quiz
<i>Live sessions</i>		Office hours				Learning sessions	

Not every week will contain all different types of assignments. For an exam week, the exam is on Thursday (on the material of the previous weeks).

Most of the material is posted ahead and it is entirely possible for you to adjust this schedule to fit better with your own work/study schedule.

Course Components:

1. **Reading quiz:** We will be using an online computer grading system called MasteringPhysics (<https://www.pearsonmylabandmastering.com/>) to do reading quiz (our course ID is **leblond58272**). Access to MasteringPhysics is provided in the PSU custom book in the bookstore.

The reading quiz are due early in the week and they are meant to be places to first learn the material, not a place to “test” your knowledge. Most of the questions are “tutorials” that will walk you through how to solve problems. You get immediate feedback when answering questions and many questions provide hints.

2. **Tutorial:** Each week, we will have a tutorial. There are three options on how to do the tutorials.
 - a. Print it and write your answer by hand, take a picture (or a scan) and submit.
 - b. Use a blank sheet, write your answer by hand clearly numbering them. Take a pic or scan and submit.
 - c. Using a tablet, write your answer by hand on the tutorial pdf and submit.

In this type of assignments, we will grade your work and not just your answer. If you have a real professional scanner, that will work great. If we have to use a phone we recommend to use scanning app which do better than just pictures.

3. **Laboratories:** The laboratories (8 in total) are designed to provide you with hands-on experience with the material being investigated in class as well as teaching data sense-making and observational experimental methods. See the list of learning objectives for more details. All of those skills and topics learned in the lab may be tested in the exams. The lab will be using the IOLab device various sensors together with the accompanying software. **While the lab component is officially only worth 10% of the grade, a zero on all labs will result in a letter grade of D at best irrespective of all other course work.**
4. **Peer-Review:** It is very beneficial for students to see each other works and to receive and give feedback. Therefore, a first draft of the weekly tutorial and lab is required to be posted every Saturday. You will then be randomly assigned to peer-review multiple of your peers and give feedback on their work (not grade their work which is only a draft anyway). The instructors will also review each draft submission and help out where

needed. The tutorial and lab will then be resubmitted for grading every Tuesday. The peer-review is graded and is part of the quiz grade. As you will see, there are some points every week in the quiz assigned to a peer-review question.

5. **Discussion Boards:** Maybe the most important part of this course is the weekly discussion board. You will be assigned a team and you will need to post and reply to your teammates.

Often the post will include three parts,

- A. Your answers and reasoning to a couple of conceptual questions on the material
- B. Comments/questions on your work on the tutorial
- C. Comments/questions on your work on the lab

Instructor and TA will provide **feedback** in the discussion boards. The discussion boards are the online analog of a lecture where the students discuss with continuous instructor feedback.

The first post of the discussion is due on Wednesday but replies will continue as long as needed.

6. **Quiz:** There will be individual quizzes throughout the semester with questions that closely resembled the exams. These are graded on correctness. You get two tries and the best score is kept. The quiz will also self-reflections questions and this is where the points for the peer-review will be attributed.
7. **TA sessions:** These are required live discussions once a week where we will review previous material and look ahead to the upcoming week. These sessions will be hosted by teaching assistants and the instructor. We will have multiple time options.
8. **Discussion hour with the prof:** I will host a discussion hour on Thursdays (not graded or required but very useful). These may be recorded but I will need students to start the discussions!

Grading Policy

Your grade in the course will be based on your performance in the labs/tutorials, on the quizzes, on the discussion boards/wrap-ups/peer-reviews and on the exams with the following weights:

Reading quiz	Quiz	Discussion boards	Labs	Tutorial	Midterms	Final	Concept Surveys	TA sessions
5%	5%	5%	10%	5%	40%	25%	2%	3%

Exams: There will be two midterm exams (10/03, 11/7 and a final exam (12/19). Both midterms are worth the same: 20% each for a total of 40%.

Exams will be closed book. Relevant physical constants and formulae will be provided. Calculators, cellular phones and other communication devices are NOT allowed and the exam will be designed such that they are not needed. The exams will be based on the assigned reading in the textbook, the material covered in course content, the quizzes, discussion boards and the laboratories/tutorial.

Each exam will be delivered through Canvas. All exams are proctored **using Examity** which allow you to take the exam anywhere and to schedule at any time (in the appropriate time window where the exam is opened). By taking this course and using Examity you agree to the following

"This course may require you to take exams using certain proctoring software that uses your computer's webcam or other technology to monitor and/or record your activity during exams. The proctoring software may be listening to you, monitoring your computer screen, and viewing you and your surroundings. By enrolling in this course, you consent to the use of the proctoring software selected by your instructor, including but not limited to any audio and/or visual monitoring which may be recorded."

The reading quiz score is calculated as the average of the scores of each reading assignment; all assignments are weighted equally. Since this is really meant to be practice we will have a 60% threshold so that 60% on the reading quiz is equivalent to 100%.

Surveys: The surveys category refers to 2 different concepts quiz done at home but proctored via Examity (they only take 45 minutes).

- The pre-concept quiz can be scheduled at any time on Aug 30-31. The test is designed to evaluate the course (not you). Knowing how you think will help me teach better. You are only graded for participation, not correctness, it is worth 1%.

- The post-concept quiz can be scheduled at any time on Dec 6-7. The test is designed to evaluate the course (not you). Knowing how you think will help me teach better. You are only graded for participation, not correctness, it is worth 1 %.

TA sessions: The teaching assistant sessions are 50 minutes live meetings held via camera and audio on zoom. We will aim to have group of about 10 and they will be hosted by either teaching assistants or the instructor. The TA sessions are graded on participation only.

Final letter grades for the course will be based on an absolute scale. The course score will be rounded to the nearest integer (69.49 becomes a 69; 69.50 becomes a 70). No curving of any kind will be employed unless the combined average exam score (computed as the combined average of all midterm and final exams taken to date) is less than 70%. In such cases, the grades on the most recent exam will be adjusted by additively raising the exam scores to allow the combined exam average to meet the target minimum of 70%.

The break points for the various grade levels are:

93% ≤	A	≤ 100%
90% ≤	A-	< 93%
87% ≤	B+	< 90%
83% ≤	B	< 87%
80% ≤	B-	< 83%
77% ≤	C+	< 80%
70% ≤	C	< 77%
60% ≤	D	< 70%
0% ≤	F	< 60%

You are responsible for **verifying all of your scores** (with the exception of the final exam score) **before** the final exam.

Excuses and Missed Work

We will not provide extensions on any deadline. We will not provide makeups (except possibly for exams). Any missed work will receive a 0 unless there are special circumstances that warrant an excuse (see below)

To account for emergencies, we will drop the lowest score in each of the following categories

- Reading quiz
- quiz
- Tutorial
- Lab
- Exam wrapper

For the discussion boards category, we will drop the lowest 2 (one discussion boards). For the TA sessions, we will allow for 3 absences through the semester.

Examinations: The lowest exam score **WILL NOT be dropped**. In the case of sudden or unexpected events that will cause them miss an exam, students are required to notify the instructor prior to the exam or as soon as is reasonably possible. Students that are physically unable to take the exam (e.g., because of an illness) at the regularly scheduled time should not attempt to attend the exam (once an examination is taken, its result is final). Makeup exams should be taken no later than three business days after being able to return to classwork; students that do not take the exam within a reasonable time frame may receive a zero for the exam. Barring emergencies, only one makeup opportunity is granted for each exam.

If an emergency is making you miss multiple coursework, please contact the instructor. Excuses will be granted for valid reasons such as

- Family emergencies. This include a death in the immediate family, death of a close friend, sudden hospitalization of a close family member, and events of similar gravity. Students should inform the course administrator about the family emergency as soon as possible.
- Student illness and injuries
- To obtain an excuse for university-approved curricular and extra-curricular activities, a student needs to obtain a letter (or a class absence form) from the unit or department sponsoring the activity. The letter must indicate the anticipated absence dates, and it must be submitted by email (or in person) to the course coordinator. A class absence form does not need to be provided for labs (only for exams and for lecture attendance).

Academic Integrity

Pretty simple really, don't cheat and don't plagiarize. If you think you are doing something wrong, you probably are. We take academic integrity very seriously. There are many ways to get help in this course and we hope you do contact any member of the instructional team if you feel unsure about the material and worry about your grade. Our goal is for you to learn the material and succeed in the course. Everyone can get an A and we are ready to help any students that struggle.

In exchange for your hard work, participation and academic integrity we promise to create the best learning environments that we can and to help you as much as we can. There will be many opportunities for help and we are fair to all students. Collaborations and discussions among the students are strongly encouraged (they help learning) but we expect your best efforts to individually learn the material and we expect honesty and academic integrity in all aspects of the course.

As described in [The Penn State Principles](#), academic integrity is the basic guiding principle for all academic activity at Penn State University, allowing the pursuit of scholarly activity in an open, honest, and responsible manner. We expect that each student will practice integrity in regard to all academic assignments and will not tolerate or engage in acts of falsification, misrepresentation, or deception. To protect the fundamental ethical principles of the University community and the worth of work completed by others, we will record and report to the office of Judicial Affairs all instances of academic dishonesty.

Disability Policy

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. Student Disability Resources (SDR) Web site provides contact information for every Penn State campus: <http://equity.psu.edu/sdr/disability-coordinator>. For further information, please visit Student Disability Resources Web site: <http://equity.psu.edu/sdr>.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <http://equity.psu.edu/sdr/guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.