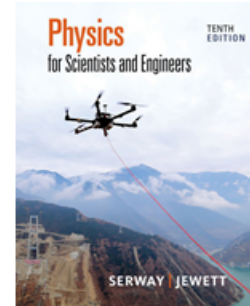


Physics 250, 2021 Fall

Palash Banerjee, Dept. of Physics, UW-Stevens Point

1 Basic information

Course title	University Physics II
Instructor	Palash Banerjee
Contact	B201 Science, palash.banerjee@uwsp.edu
Office hours	MTWF 10 — 11 a.m. or by appointment.
Pre-requisite	Math 121 (Calculus II)
Textbook	<i>“Physics for Scientists & Engineers”</i> by Serway and Jewett.
Required	Laboratory notebook and a scientific calculator.



2 Course description

Physics 250 covers foundational topics in electricity, magnetism, waves, and optics and continues to introduce you to the mathematical representation of the physical world. Class time will be used to discuss a limited number of fundamental topics but in greater conceptual and mathematical depth. This theoretical work will be supplemented by extensive experiments that introduce you to laboratory instruments and measurement techniques, as well as the mathematical methods of data analysis.

3 Learning outcomes

The assignments in this course support the following learning outcomes:

1. You should be able to explain the major conceptual ideas in physics and apply them to the solution of scientific problems.
2. You should be able to apply mathematical methods to the solution of physics problems.
3. You should be able to design and perform an experiment, and be able to construct a mathematical model to explain the results you obtain from that experiment.
4. You should be able to improve your writing skills and learn to write clearly. If you write clearly, you will think clearly and this will sharpen your analytical skills.

4 Course assignments

1. **Homeworks:** Homework will be assigned every Thursday in discussion and will be due in one week. You may expect approximately 12 homeworks during the course and I will drop your lowest score. It is a good learning experience to work together in a group as you do your homework, but you *may not* copy each others' work. Your homework assignments count for 15% of your grade.
2. **Discussion:** Discussion time will be spent reviewing important concepts and mathematical methods. There will be a short quiz so you can check your own learning. Your discussion will count for 10% of your grade and I will drop your lowest discussion score.
3. **Laboratory:** The physics laboratory is a place for you to learn measurement techniques, the methods of data analysis and practice writing a report for a technical audience. Your laboratory performance will count for 15% of your course grade and I will drop your lowest score.
4. **Exams:** There will be *two* midterm exams during the semester not counting your final exam. The midterms will be held during lab times on a Tuesday. Each midterm counts for 20% of your grade, and the final exam counts for 20% of your grade as well. *All* the exams count and no score will be dropped. If you miss any exam, you will receive a zero for that exam.

5 Grading and evaluation

I will calculate your grade based on a weighted percentage of your scores as shown in the table to the left below. Your final letter grades will be determined as shown in the table to the right below.

Assignment	Value	Total score	Grade
Homeworks	15%	93% and above	A
Laboratory work	15%	90–92%	A-
Discussion	10%	87–89%	B+
1st exam	20%	83–86%	B
2nd exam	20%	80–82%	B-
Final examination	20%	77–79%	C+
		73–76%	C
		70–72%	C-
		67–69%	D+
		60–66%	D
		below 60%	F

I do *not* grade on a curve. Scores will be rounded up according to the following example: 86.6 – 86.9% will be rounded up to 87% and become a B+, but 86.0 – 86.5% will remain at 86% and will earn a B.

6 Course schedule

The tentative course schedule is shown in the table below. I will try my best to follow this but I may decide to spend more or less time on certain topics depending on how the semester proceeds.

Week	Chapter: Topic	Laboratory
(1) Aug 29	Ch 22: We meet electric charges and electrostatic forces.	-
(2) Sep 5	Ch 22: We discover electric fields and learn some mathematical methods.	The electroscope
(3) Sep 12	Ch 23: We meet Gauss' law and learn about surface integrals and symmetry.	Mapping electric field lines
(4) Sep 19	Ch 24: We find a connection between work done, line integrals and electric potential.	dc circuits
(5) Sep 26	Ch 25: We apply the theory of fields and potentials to capacitors.	Electrical energy and power
(6) Oct 3	Ch 26: We meet the microscopic theory of electrical conduction.	Mid term exam 1
(7) Oct 10	Ch 27: We construct the theory of dc circuits.	Solar cell circuits
(8) Oct 17	Ch 27: We learn about sensors and measuring instruments.	RC circuits
(9) Oct 24	Ch 28 & 29: We discover magnetic fields and forces and learn about cyclotron orbits.	Resistance bridge
(10) Oct 31	Ch 30: We make an unexpected discovery — the law of electromagnetic induction.	Solenoids
(11) Nov 7	Ch 16: We study waves and wave functions and find a use for partial differential equations.	Mid term exam 2
(12) Nov 14	Ch 33: We encounter the awesomeness of polarized electromagnetic waves.	Interaction of polarized em waves with matter
(13) Nov 21	Ch 34: We investigate mirrors and lenses and learn appearances can be deceptive.	Lenses and imaging systems
(14) Nov 28	Ch 36: We study a remarkable experiment in all of physics — Young's double slit interference experiment.	Prism spectrometer
(15) Dec 5	Ch 37: We study the diffraction of waves.	N-slit interference
(16) Dec 12	Final exam, Thu Dec 16 2:45 — 4:45 p.m.	

7 *Other course policies*

1. If you are going to be late on an assignment, please let me know. It will be difficult for me to accept a late assignment after I post the solutions.
2. No make-up labs will be offered and no make-up exams will be offered.
3. Make-up work will only be accepted in the case of excused absences. Excused absences include death in the immediate family, illness with a note from the appropriate health care professional, religious observance, or an event in which you officially represent the University of Wisconsin-Stevens Point and the event directly conflicts with an exam or lab. Excused absences must be approved with documenting materials prior to the date of absence.
4. Please *do not* copy each others homeworks, class assignments, laboratory reports, and examinations and pass them off as your own. Any such incidents will be treated seriously and in accordance with University policy.
5. Food and drinks are not permitted in the laboratory.
6. The schedule for the finals is set by the University. I will not schedule an early final exam for whatever reason. Please don't ask.
7. I *do not* assign work for extra credit and there are *no* bonus points that you can earn. Once you hand in your final exam, there is nothing more you can do to change your grade.

8 *Covid policy*

At all UW-Stevens Point campus locations, the wearing of face coverings is mandatory in all buildings, including classrooms, laboratories, studios, and other instructional spaces. Please note that unless everyone is wearing a face covering, in-person classes cannot take place. Any student with a condition that impacts their use of a face covering should contact the Disability and Assistive Technology Center to discuss accommodations in classes.

It is difficult to predict how the semester will unfold during Covid times. But I promise to be flexible and will help you meet the course objectives should you need to be absent from classes for Covid reasons.