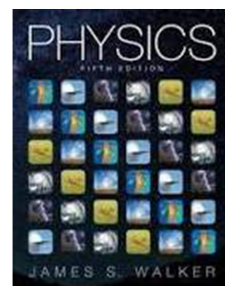


Physics 204, 2022 Spring

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

1 Basic information

Course title	Physics 204, College Physics II
Instructor	Palash Banerjee
Contact	B-201 Science, palash.banerjee@uwsp.edu
Office hours	TWTh 12 noon — 1 p.m., or by appointment.
Pre-requisite	Physics 203 and knowledge of algebra and trigonometry.
Textbook	"Physics" by Walker.
Also required	a lab notebook, a straightedge and a protractor, a scientific calculator, and a three-ring binder.



2 Course description

Physics 204 covers foundational topics in electricity, magnetism, and optics and introduces you to multiple scientific representations of the physics world. These representations are (A) conceptual — you must be able to talk about the physics, (B) graphical — you must be able to draw the physics, and (C) analytical — you must be able to describe the physics using mathematics. Class time will be used to discuss a limited number of fundamental topics but in greater conceptual depth. This theoretical work will be supplemented by experiments that introduce you to laboratory instruments and measurement techniques as well as the methods of data analysis.

3 Teaching style

I believe that fewer topics presented carefully and discussed in substantial depth is better for your training as junior scientists. I also believe that everyone learns differently and I promise to present the same material several different ways to make it work for *you*.

4 Learning outcomes

The assignments in this course support the following learning outcomes:

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

5 Course assignments

1. **Homeworks:** Homeworks will be assigned on Friday and be due in one week. You may expect approximately thirteen homeworks during the course. You may work together in a group but you *may not* copy each others' work. Your homeworks count for 15% of your grade and I will *not* drop any homework score.
2. **Discussion:** Discussion time will be spent reviewing important concepts and methods and taking a quiz. Your discussions count for 10% of your grade and I will *not* drop any discussion score.
3. **Laboratory:** The physics laboratory is where you learn to use some common electrical instruments, perform careful measurements, reduce the data to results using analytical methods, and present a thoughtful and neatly written account of your work. I consider these four steps to be part of the standard scientific workflow and as junior scientists you should conscientiously practice these skills. Your laboratory work counts for 15% of your grade and I will drop your lowest score. Your lab notebooks will be due at the beginning of class on Monday.
4. **Exams:** There will be *two* midterm exams during the semester held during lab times. 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.

6 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 quiz	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.

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.

9 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) Jan 23	Ch 19: We meet electrostatic interactions.	Extension of a wire.
(2) Jan 30	Ch 19: We discover electric fields and learn some analytical methods.	The electroscope.
(3) Feb 6	Ch 20: We find a connection between electric fields, work done, and the electric potential.	Mapping electric field lines.
(4) Feb 13	Ch 20: We apply the theory of fields and potentials to electrical devices.	dc circuits.
(5) Feb 20	Ch 21: We meet the theory of electrical conduction.	Electrical energy and power.
(6) Feb 27	Ch 21: We construct the theory of dc circuits and learn about sensors and instruments.	Mid term exam 1.
(7) Mar 6	Ch 22: We learn how to generate magnetic fields.	Solar cell circuits.
(8) Mar 13	Ch 22: We meet magnetic forces and cyclotron orbits.	RC circuits.
(-) Mar 20	Spring break	
(9) Mar 27	Ch 23: We discover how to generate an induced current.	Solenoids.
(10) Apr 3	Ch 25: We encounter the awesomeness of polarized electromagnetic waves and learn about transmitters and antennas.	Induced EMF.
(11) Apr 10	Chs 25 & 28: We build the wave model for light and learn to draw phasor diagrams.	Mid term exam 2
(12) Apr 17	Ch 26: We build the ray model for light and learn about refraction and lenses.	Polarized light.
(13) Apr 24	Ch 27: We find a use for the ray model and discuss focal planes and imaging systems.	Refraction and dispersion.
(14) May 1	Ch 30: We build the quantum model for light and learn about photons and the photoelectric effect.	Converging lenses.
(15) May 8	We catch up and review and realize we love physics.	Corrective optics.
(16) May 15	Final exam, Mon May 16, 8 — 10 a.m. in SCI A113.	