Syllabus, Physics 204

Palash Banerjee

1 *Basic information*

Course title	Physics 204, offered 2024 Spring semester
Instructor	Palash Banerjee
Contact	SCI B-201, palash.banerjee@uwsp.edu
	Virtual section students should contact Dr. Aaron Steffen, asteffen@uwsp.edu
Student hours	W 4 pm, Th 12 noon, and F 10 am in SCI B-201.
Pre-requisite	Physics 203 and knowledge of algebra and trigonometry.
Textbook	*"Physics"* by Walker.
Also required	a straightedge and a protractor,
	a scientific calculator, and a three-ring binder.

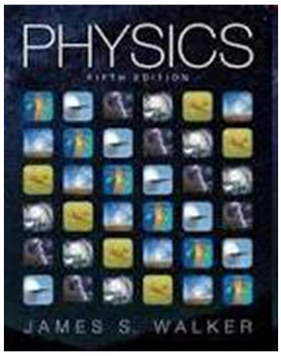

Figure 1: Your textbook, "Physics" 5th ed., by James Walker.

2 *Course description*

Physics 204 covers topics in electric fields, voltage and electric circuits, magnetic fields, and optics. I'll spend class time introducing you to the fundamental principles and their applications. And I would also like to introduce you to the "physics way" of learning. By this, I mean I'll show you how to

1. Put the concepts and principles first, talk about the physics, and make the proper arguments,
2. Draw neat graphics to support your arguments, and
3. Support your arguments and graphics with analytical work.

Doing physics this way will make your learning more structured and systematic. You will begin to discover patterns and identifying these patterns will make your learning easier and somewhat fun. There will be fewer things to memorize. This will free up your mind so you can spend more time discussing and solving interesting scientific problems. To support this style of learning, I will discuss fewer topics but in greater conceptual depth with lots of examples.

Figure 2: Also required — a notebook, a three ring binder for the handouts, a straightedge and a protractor, as well as a scientific calculator.

3 *Learning outcomes*

The assignments in this course support the following learning outcomes:

1. You should be able to explain the fundamental principles in physics and apply them to the solution of scientific problems.
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.

4 *Course assignments*

1. Homeworks: Homeworks will be assigned weekly and be due beginning of class Monday. You may expect approximately 12 ± 1 homeworks

during the course. You may work together in a group but you *may not* copy each others' work. All your homework assignments count equally and I will *not* drop any homework score.

2. Discussion: I will use the discussions to review physics ideas and make connections with previous lecture & lab material. Class time will be spent working on a short homework style problem set. I will provide solutions at the end so you can check your own work. Sometimes I may give you a friendly quiz. All your discussion assignments count equally 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 neatly written account of your work. I consider these four steps to be part of the standard scientific workflow and you should conscientiously practice these skills. Your lab reports are are due Friday and I will drop your lowest score.

4. Exams: There will be *two* midterm exams during the semester held during lab times and one final exam. *All* the exams count and no score will be dropped. If you miss any exam, you will receive a zero for that exam.

To help plan out your weekly schedule, your physics assignments will only be due on certain days as shown below:

(a) Homeworks are due Monday

(b) Lab reports are due Friday

5 Grading and evaluation

I will calculate your grade based on a weighted percentage of your scores as shown in Table 1. Your final letter grades will be determined as shown in Table 2.

Assignment	Value
Homeworks	17%
Laboratory work	15%
Discussion & quiz	8%
1st exam	18%
2nd exam	20%
Final examination	22%

Table 1: Each assignment category contributes a weighted percentage to your overall grade. Non-exam related assessments contribute 40% towards your final grade, and the three exams contribute the remaining 60%.

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.

Total score	Grade
93% and above	A
90–92%	A-
87–89%	B+
83–86%	B
80–82%	B-
77-79%	C+
73–76%	C
70–72%	C-
67–69%	D+
60–66%	D
below 60%	F

Table 2: Your final letter grades will be determined based on this table.

6 General course policies

1. If you are going to be late on an assignment, please let me know. I will accept only one late assignment and no excuses are needed. Subsequent late assignments will not be accepted.

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 absences that occur due to death in the immediate family, illness with a note from the appropriate health care professional, religious observance, an event in which you officially represent the University of Wisconsin-Stevens Point and the event directly conflicts with an exam or lab. Such 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. You may collaborate but your work must be your own. If I find two or more assignments very similar to each other, I will be forced to give all such assignments a zero.

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.

7 *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 21	Ch 19: We meet electrostatic interactions.	—
(2) Jan 28	Ch 19: We discover electric fields and learn some analytical methods.	Charge diagrams and the electroscope.
(3) Feb 4	Ch 20: We find a connection between electric fields, work done, and electric potential.	Mapping electric field lines.
(4) Feb 11	Ch 20: We apply the theory of fields and potentials to electrical devices.	Conductance of a wire.
(5) Feb 18	Ch 21: We meet the theory of electrical conduction.	To build & operate a water heater.
(6) Feb 25	Ch 21: We construct the theory of circuits and learn about network topologies.	Mid term exam 1.
(7) Mar 3	Ch 21: We apply the theory of circuits and learn about sensors and instruments.	Resistivity of steel.
(8) Mar 10	Ch 22: We learn how to generate magnetic fields.	Capacitor circuits
(–) Mar 17	Spring break	
(9) Mar 24	Ch 22: We meet magnetic forces and learn about cyclotron orbits.	Solar panels as emf devices.
(10) Mar 31	Ch 23: We are amazed by the discovery of induced currents.	Calibrating a field coil.
(11) Apr 7	Ch 25: We encounter the awesomeness of polarized electromagnetic waves and learn about transmitters and antennas.	Mid term exam 2
(12) Apr 14	Chs 25 & 28: We build the wave model for light and learn about wavefronts and refraction.	Magnetic fields and forces.
(13) Apr 21	Ch 26: We cannot believe our eyes after learning how refraction changes our perception of the scene in front of us.	Optics I, Interaction between polarized light and a transparent solution of molecules.
(14) Apr 28	Ch 27: Our excitement builds as we learn to project a real image onto a screen.	Optics II, Focal length of a lens.
(15) May 5	Ch 27: We celebrate the impossible as we observe the complete destructive interference of wavefronts.	We catch up and review and realize we love ♡physics♡.
(16) May 12	Final exam, Mon May 13, 8:00 — 10:00 am in SCI A-113.	