

## Physics 240, 2018 Fall

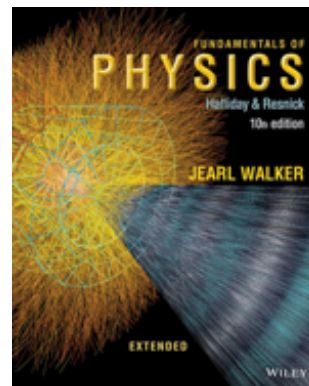
Palash Banerjee, Dept. of Physics, UW-Stevens Point

### 1 Basic information

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Course title	University Physics I
Instructor	Palash Banerjee
Contact	B125 Science, palash.banerjee@uwsp.edu
Open house	TW 3 — 5 p.m. in the library, 2nd floor SE study area
Pre-requisite	Math 120 (Calculus I)
Textbook	“Fundamentals of Physics” by Halliday, Resnick and Walker.
Required	Scientific calculator and a one-inch three-ring binder

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### 2 Course description

Physics 240 covers foundational topics in mechanics and introduces you to thinking about the natural world in mathematical terms. Class time will be used to discuss a limited number of fundamental topics but in greater depth. I will support this discussion with examples from applied physics, so you can connect mathematical ideas with their applications. I will spend class time discussing the following topics — (a) frames of reference, vectors, and the theoretical description of motion, (b) Newton’s laws and the theory of interactions, (c) conservation laws that constrain the outcome of these interactions, (d) the theoretical description of a spinning object, and (e) selected topics in the theory of gravitation and space mechanics. I hope that by studying these fundamental physics topics, you will develop a deeper and keener understanding of *how and why* the world around you works the way it does.

### 3 Course objectives

I want to give you the conceptual and mathematical tools you need to be successful in your science and engineering career. And I also want to show you how to write clearly and simply. If you write clearly, you will think clearly and this will sharpen your analytical skills. Therefore, we will spend the entire semester practicing these two essential skills — *know your tools, and write clearly.*

## 4 Course schedule

Week	Chapter: Topic	Laboratory
(1) Sept 3	Ch 2: We meet velocity and acceleration, and find a use for <u>differential calculus</u> .	Uncertainties
(2) Sept 10	Ch 3: We try mightily and become best friends with <u>vectors</u> .	Motion diagrams
(3) Sept 17	Ch 4: We discover frames of reference and our lives change forever.	Vectors
(4) Sept 24	Ch 5: We meet Newton's laws and wish everything were this simple.	Projectile motion
(5) Oct 1	Ch 6: We begin to apply Newton's laws and realize that with great power comes great responsibility.	Mid term exam 1
(6) Oct 8	Ch 7: We encounter the work done by a force and find a use for <u>integral calculus</u> .	Newton's Laws
(7) Oct 15	Ch 8: We meet the mysterious potential energy function.	Circular motion
(8) Oct 22	Ch 9: We discover the <u>awesomeness</u> of the center of mass for a system of particles.	Machines and work
(9) Oct 29	Ch 9: We meet linear momentum and learn rocket science.	Friction
(10) Nov 5	Ch 10: We encounter a rotating object and revisit some old friends from Ch 2.	Mid term exam 2
(11) Nov 12	Ch 11: We meet angular momentum and discover the first great application of <u>vector calculus</u> .	Center of mass
(12) Nov 19	Ch 13: We encounter the theory of Gravitation and learn to plan an interplanetary voyage.	Equilibrium
(13) Nov 26	Ch 14: We discover buoyant forces without getting into a bathtub.	Moment of inertia
(14) Dec 3	Ch 14: We find a use for Bernoulli's equation.	Buoyant forces
(15) Dec 10	We catch up and review and realize we <u>love</u> Physics.	Review
(16) Dec 17	Final exam Tue Dec 18	

## 5 Course assignments

- Homeworks:** It is difficult to learn without practice. Therefore homeworks are an essential part of this course. Homework will be assigned every Friday in class and will be due in one week. You may discuss concepts and ideas with each other but you *may not* copy each others' work. Your homework assignments count for 20% of your grade. You may expect approximately 13 homeworks during the course and I will drop your lowest score.
- Discussion:** I will give you a weekly quiz during the Monday discussion. The quiz will be based on the previous weeks' topics and should help you with your homework. Your discussion quiz will count for

10% of your grade. I will drop your lowest discussion score.

3. **Laboratory:** Physics is an experimental science and the laboratory is a place for you to learn measurement techniques and the methods of data analysis. The laboratory is not complete unless you submit a clearly written technical report. 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. These exams will be held in place of the regular laboratory session. The first midterm counts for 15% of your grade, the second 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	20%	93% and above	A
Laboratory work	15%	90–92%	A-
Weekly quiz	10%	87–89%	B+
1st exam	15%	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. Food and drinks are **not** permitted in the laboratory.
2. No make-up labs will be offered; no make-up exams will be offered. I will accept **only one** late homework per student during the course. No excuses are needed but you need to tell me *before* the assignment is due that you will submit late. Subsequent late submissions will not be accepted.

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. 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.
  6. I *do not* assign work for extra credit. 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.**
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