

PHYSICS 151

UNIVERSITY OF NEW MEXICO

SUMMER 2014

Instructor: Dr. Mark Morgan-Tracy
Email: mtracy@unm.edu

Course Number: PHYC 151
Section Number: 001

Meeting Place: REGH 114
Meeting Time: MTWR 11:00-12:15

Office Hours in 109 Regener Hall: Wednesday, 1:00-5:00

Friday, 9:30-1:00 PM

Home Page: panda.unm.edu/Courses/morgan-tracy/151Summer/Phys151Summer14.htm

Course Description

Welcome to Physics 151, the first semester of algebra-based introductory physics. This semester we will be covering the basics of physics: kinematics and dynamics in one and two dimensions, rotational motion, and conservation of energy and momentum. (All studied without the use of calculus or other scary higher mathematics) If we get lucky, we will also get to study thermodynamics, fluids, oscillatory motion, and waves. This course is fantastic in that satisfies premedical, pre dental, preoptometry, and certain technical requirements. No previous knowledge of physics is assumed; however, problem solving requires good algebra skills and a working knowledge of trigonometry is helpful.

I hope that you do well in this course. You will need to work hard to succeed. I can only do so much to cram the concepts that we will cover into your brain, the rest is up to you. If you are willing to really think about what you are reading, to do the homework, and most importantly to let me know when you're still not getting something, then I'm sure we can have a very successful class for everyone.

Prerequisite: Math 123 (Trigonometry).

Prerequisite: Math 150 (Pre-Calculus) or Math 162 (Calculus I) or Math 180 (Elements of Calculus I).

Text

The textbook used for this class is the second edition of **College Physics: A Strategic Approach** by Knight, Jones, and Field, Pearson Addison-Wesley, 2009.

Learning Outcomes

The overall objective is that the students can describe physical phenomena using a variety of models and develop certain analytical skills associated with problem solving. By the end of the course, the student should be able to:

- convert units within the S. I. system as well as between S. I. and the U. S. customary system
- analyze vectors by
 1. resolving a vector into components
 2. finding the magnitude and direction of a vector from its components
 3. performing vector addition using both the graphical and component methods
- select the appropriate equation to use in solving new and different one and two-dimensional constant-acceleration problems
- sketch free body diagrams
- apply Newton's laws of motions to solve for unknowns in new and different static and dynamics problems
- apply conservation of momentum to predict characteristics of collisions
- use the law of conservation of energy in solving new and different motion problems
- apply the first law of thermodynamics to predict certain thermal responses of a substance
- describe the fundamental properties of waves and periodic motion.

Office Hours

I will be available to provide additional tutoring and to help students with their homework in room 109 of Regener Hall on Wednesdays (1:00-5:00) and on Fridays (9:30-1:00). I realize that these times will, most likely, be inconvenient to those students who have jobs or other classes, and I encourage you to contact me to set up an appointment for a different time. Email is the best and quickest way of contacting me. I will try my best to accommodate your schedule. *Note:* There will be no office hours held on July 4.

Calculator

While Physics, at this level, is an excellent example of the power and uses of algebra, its numerical calculation requirements are fairly simple. To that end, you do not need a scientific or graphing calculator for this class. The basic requirements is that your calculator must be able to do scientific notation as well as simple trigonometric (sine, cosine, and tangent) functions. If you have a scientific calculator, I encourage you to use it to its full capacity; however, its extraordinary use (like solving quadratic equations) on homework and tests must be clearly indicated.

Course Requirements

I-Clickers: I-clickers will be used throughout the lecture to give students the opportunity to actively participate in the lecture and to interact with each other. Throughout each lecture, students will be given a series of conceptual or easy-to-calculate questions. Upon initially seeing the question, students are required to use their clickers to answer the question individually. Students will then discuss their answers with nearby classmates and the question will be given again. Students who get the correct answer on the second try will receive three points while students who still have an incorrect answer will receive two points. Non-attendance will result in zero points. For each lecture, each student's total points divided by that day's maximum will give a daily percentage. At the end of the term, your three lowest daily percentages will be dropped when determining your average.

If you do not have an I-clicker from the previous semester, they can be purchased at the bookstore. You must register your I-clicker for the new semester by going to www.iclicker.com/registration and following the instructions there. Students should use their NetID when registering their clicker. Please note that **you must re-register your I-clicker every term**. Instructions and help on the I-clickers can also be found at panda.unm.edu/Courses/StudentHelp/index.html.

Reading Quizzes: Most days after class, a specific reading assignment will be posted on the class's webpage. To earn points for doing that reading assignment, students are required to answer two questions that are to be turned in at the end of the next lecture:

1. What, in your opinion, was the most important concept of the reading assignment?
2. What concept in the reading assignment did you have the most trouble understanding? (What was the "muddiest point"?) If everything was clear then what was the most interesting concept?

The answers to these questions must be complete sentences and must have proper spelling and punctuation. (No text spelling will be accepted.)

At the end of lecture students will spend a minute answering one additional question:

3. Did today's lecture help with your muddy point? If not, what are you still confused about? If so, are there any other points in today's lecture that you did not understand?

Students will receive one point per question answered. When determining your reading quiz average at the end of the term, your three lowest scores will be dropped.

Homework: Each week, I will be assigning 5-10 homework problems. Students *must go to the class's webpage to find the homework problems*. A large fraction of the assigned problems will be modified versions of textbook questions. I encourage you to form study groups with other students in this class and work on the homework together; physics is a collaborative subject. Homework assignments will be **neatly** written out by the students and must show all steps. Each problem will be worth five points and will be graded based upon the level of completion. Assignments are due by Friday at 1:00 and may be turned into me during my office hours. (The week of the July-4th holiday, homework will be due on Monday.) Late homework will not be accepted, but students may turn in missed assignments for a 65% participation grade. **I do not drop a homework score!** Homework averages will be based on the maximum class score. If somebody earns the maximum possible homework score, there will be no curve.

Mini-Tests: After completing the topic from the previous class, students will have an in-class, two- or three-question test at the end of the first lecture of every week. (The week after the July-4th holiday, the mini-test will be on Tuesday.) The questions will be based on the previous week's homework material and will be of similar difficulty. Each mini-test will be worth ten points and will be graded similar to the homework. Your lowest mini-test grade will be dropped when determining the semester average. Students should bring a calculator with them to lecture.

Final Exam: An in-class comprehensive final exam will be given on the last day of class, Thursday July 24, during normal class time. You must take the final in order to pass the class. In the event that UNM has a closure on the date of the final exam, final grades for students will be calculated based upon the work assessed up to that point.

Course Grade: At the end of the semester, the course grade will be calculated based upon the following percentages. In the case that the average of **all seven** mini-test grades exceeds the homework average, the higher average will be used for your homework score.

Reading Quiz: 5%	In-Class Clickers: 10%	Homework: 25%	Mini-Tests: 40%	Final Exam: 20%
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Letter grades will be assigned according to the following scale:

A+ : 99-100	A : 93-98.99	A- : 90-92.99	B+ : 87-89.99	B : 83-86.99	B- : 80-82.99
C+ : 77-79.99	C : 73-76.99	C- : 70-72.99	D+ : 67-69.99	D : 63-66.99	D- : 60-62.99

Attendance Policy

Regular and punctual attendance is required. UNM Pathfinder policies apply, which in part means instructor drops based on non-attendance are possible. This policy applies regardless of the grading option you have chosen.

Accommodation Statement

Accessibility Services (Mesa Vista Hall 2021, 277-3506) provides academic support to students who have disabilities. If you think you need alternative accessible formats for undertaking and completing coursework, you should contact this service right away to assure your needs are met in a timely manner. If you need local assistance in contacting Accessibility Services, see the Bachelor and Graduate Programs office.

Course Calendar

Below you will find a listing of the topics covered in this class along with the corresponding text chapter and an estimate of how long I believe it will take to cover them. Students should consult the class webpage for specific information about which sections of each chapter will be covered during class.

<u>Week</u>	<u>Date</u>	<u>Topic</u>	<u>Week</u>	<u>Date</u>	<u>Topic</u>
1	June 2	Ch. 1 - Concepts of Motion and Mathematical Background	5	June 30	Ch. 10 - Energy and Work
		Ch. 2 - Motion in One Dimension			Ch. 7 - Rotational Motion
	June 6	Last Day to Add Class.		July 4	No Office Hours
2	June 9	Ch. 3 - Vectors and Motion in Two Dimensions	6	July 7	Ch. 8 - Equilibrium and Elasticity
	June 13	Last Day to Drop Class with 100% Refund		July 11	Ch. 11 - Using Energy
3	June 16	Ch. 4 - Forces and Newton's Laws of Motion	7	July 14	Last Day to Drop Without Dean's Permission
		Ch. 5 - Applying Newton's Laws			Ch. 12 - Thermal Properties of Matter
					Ch. 13 - Fluids
4	June 23	Ch. 6 - Circular Motion, Orbits, and Gravity	8	July 21	Ch. 14 - Oscillations
		Ch. 9 - Momentum			Ch. 15 - Traveling Waves and Sound
				July 24	Ch. 16 - Superposition and Standing Waves
					Final Exam