

PHYSICS 151
UNIVERSITY OF NEW MEXICO
FALL 2012

Instructor: Dr. Mark Morgan-Tracy	Email: mtracy@unm.edu
Course Number: PHYS 151	Section Number: 003
Meeting Place: Regener Hall 114	Meeting Time: MWF 12:00-12:50 AM
Office Hours: Wednesday 1:30-3:30	Place: Regener Hall 109
Friday 10:00-12:00	
Friday 2:00-3:30	
Thursday 1:00-5:00	Place: P&A Department 11
Home Page: panda.unm.edu/Courses/morgan-tracy/151-BAMD/BAMD151Fall112.htm	

Course Description

Welcome to the special BA/MD program version of Physics 151, the first semester of algebra-based introductory physics. This semester we will actively 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 participate in class, 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).

Corequisite: Phyc 151L sections 003 or 008 (General Physics I Lab)

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 thermal expansion and specific-heat equations 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 1:30-3:30 and on Fridays 10:00-12:00 and 2:00-3:30. (Please note that if there are many students seeking help we may relocate to a larger nearby room.) On Thursdays 1:00-5:00, I will be in room 11 of the Physics and Astronomy building which is located on the corner of Lomas and Yale Boulevard (down the hill from the duck pond). 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.

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 use on homework and tests must be clearly indicated.

Course Requirements

In-Class Exercises: In this class, you will actively participate in your learning. I will perform very little lecturing. Class time will instead be spent working

together in groups of three or four students on the concepts and problems that you will see on the homework and exams. The groups will be assigned by the instructor and will change regularly throughout the semester. Students will be given training in their group roles during the first week of class. Each worksheet or problem will be worth a total of five points with each member of the group awarded the same score. When determining your average at the end of the term, your three lowest scores will be dropped.

I-Clickers: At the end of every class period, each student will get a chance to cement the concepts worked on that day by individually answering a conceptual or easy-to-calculate question using an I-clicker. Students will receive three points for a correct answer, two points for an incorrect answer, and zero points for non-attendance. At the end of the term, your three lowest quizzes will be dropped.

If you do not have an I-clicker from the previous semester, one 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 Banner ID number 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: Before every lecture, students will take a short (two or three question) online quiz about the material to be covered in that lecture. These reading quizzes will be administered on the Mastering Physics website. They will be posted a day in advance and are due by 11:59 of the evening prior to lecture. (Monday's lectures will have their reading quizzes due Sunday evening.) When determining your average at the end of the term, your three lowest reading quizzes will be dropped. Specific reading assignments will be posted on the class's webpage.

Homework: Each week, I will be assigning 5-10 homework problems from the textbook. The purpose of the homework is to make sure that you are keeping pace with the class and understanding the topics being discussed. 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 a combination of online questions that will be collected using the Mastering Physics system as well as written questions that will be turned in to me. Mastering Physics (<http://www.masteringphysics.com/>) access can be obtained by purchasing a new textbook, through the bookstore, or online. The course ID for this term is **MPMORGANTRACYBAMD35189**. The Mastering Physics assignments will be due by 11:59PM of the due date (usually Fridays). A late assignment may still be done with an automatic 10% deduction for each day that it is late. Written assignments must show all steps and should be neatly written in pencil. Each problem will be given partial credit based on the level of completion and **organization**. Written assignments are due to me at the end of my Friday office hours at 3:30 PM. Late written homework assignments may be turned in for a 65% participation grade. **I do not drop a homework score!** Students are expected to do every problem assigned. Homework averages will be based on the maximum class score.

Exams: There will be three in-class exams given throughout the semester. (See schedule for dates.) Exams will consist entirely of written questions that will be graded like the written homework problems. Occasionally there may also be a take-home component which will be due on the day of the exam. Your lowest exam score will be dropped when determining your exam average.

Final Exam: An in-class, comprehensive final exam will be given on Friday, December 14 from 10:00 AM - 12:00 PM. In the event of a UNM 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 three** exam grades exceeds the homework average that higher average

will be used for your homework score.

Reading Quiz: 5%	In-Class Work: 10%	Homework: 25%
Exams: 40%	Final Exam: 20%	

Letter grades will be assigned according to the following scale:

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

Supplementary Class Material

All supplementary class materials will be posted online. Students are expected to regularly check the class's webpage, panda.unm.edu/Courses/morgan-tracy/151-BAMD/BAMD151Fall12.htm.

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>CHAPTER AND TOPIC</u>
1	August 20	Ch. 1 - Concepts of Motion and Mathematical Background
2	August 27	Ch. 2 - Motion in One Dimension
	August 31	Last day to Enroll
3	September 3	Labor Day - No Class Ch. 3 - Vectors and Motion in Two Dimensions
	September 7	Last day drop without a grade.
4	September 10	Ch. 3 (continued)
	September 14	Last day to change grading options.
5	September 17	Exam 1 Ch. 4 - Forces and Newton's Laws of Motion
6	September 24	Ch. 5 - Applying Newton's Laws
7	October 1	Ch. 6 - Circular Motion, Orbits, and Gravity
8	October 8	Ch. 7 - Rotational Motion
	October 10	Exam 2
	October 12	Fall Break
9	October 15	Ch. 8 - Equilibrium and Elasticity
10	October 22	Ch. 9 - Momentum
11	October 29	Ch. 10 - Energy and Work
12	November 5	Ch. 11 - Using Energy*
	November 9	Last day to withdraw without dean's approval.
13	November 12	Ch. 12 - Thermal Properties of Matter*
14	November 19	Ch. 12 (continued)
	November 21	Exam 3
	November 23	Thanksgiving
15	November 26	Ch. 13 - Fluids* Ch. 14 - Oscillations*
16	December 3	Ch. 15 - Traveling Waves and Sound* Ch. 16 - Superposition and Standing Waves*
	December 7	Last day to withdraw with dean's approval.
	December 14	Final Exam.

* Selected topics to be covered as time permits.