

PHYSICS 160  
UNIVERSITY OF NEW MEXICO  
SPRING 2013

Instructor: Dr. Mark Morgan-Tracy	Email: <a href="mailto:mtracy@unm.edu">mtracy@unm.edu</a>
Course Number: PHYC 160	Section Number: 101
Meeting Place: Regener Hall 103	Meeting Time: MWF 11:00-11:50 PM
Office Hours: Wednesday 1:00-5:00	Place: Regener Hall 109
Friday 1:00-3:30	
Thursday 1:00-5:00	Place: P&A Department 11
Home Page: <a href="http://panda.unm.edu/Courses/morgan-tracy/160/Phys160Spring13.htm">http://panda.unm.edu/Courses/morgan-tracy/160/Phys160Spring13.htm</a>	

## Course Description

Welcome to General Physics I, the first semester of calculus-based introductory physics. This semester we will be covering the basics of physics: kinematics, dynamics (Newton's laws of motion), energy, conservation of energy, linear momentum, conservation of linear momentum, rotational motion, angular momentum, conservation of angular momentum, gravitation, periodic motion, and waves. This course will give you the basic skills necessary for continued success, not only upcoming physics classes, but in all future science courses.

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.

## Pre- or Corequisite

Math 162 (Calculus I).

## Text

The textbook used for this class is the 13<sup>th</sup> edition of **University Physics** by Young and Freedman, Pearson Addison-Wesley, 2008.

## 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
- use the law of conservation of energy in solving new and different motion problems
- apply conservation of momentum to predict characteristics of collisions
- 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 1:00-3:30. (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 and calculus, 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

**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 score out of 1. At the end of the term, your three lowest days will be dropped in determining your average.

If you do not have an I-clicker from the previous semester, one can purchased at the bookstore. You must register your I-clicker for the new semester by going to [www.iclicker.com/registration](http://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](http://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.) Once they begin a quiz, students have 30 minutes to complete it. 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 and the Mastering Physics website. 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 **PHYC160SPRING13**. 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!** Homework averages will be based on the maximum class score. If somebody earns the maximum possible homework score, there will be no curve.

Extra Credit: Shortly after each lecture, additional problems will be made available for student on the Mastering Physics website. Students who answer these problems by noon of the next day will be given extra credit. (Friday's extra credit problems are due by noon on Saturday.) At the end of the term, students may earn a maximum 4% increase in their final class average based on the number of problems correctly answered. Solutions to the extra credit problems will be posted on the class's webpage.

Exams: There will be four in-class exams given throughout the semester. (See schedule for dates.) Exams will consist of some, to be determined, combination of multiple choice and written questions. 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 in determining your exam average.

Final Exam: An in-class, comprehensive final exam will be given on Wednesday, May 8 from 10:00AM -12:00PM. 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 four* exam grades exceeds the homework average that higher average will be used for your homework score.

Reading Quiz: 3%	In-Class Quiz: 7%	Homework: 25%
Exams: 50%	Final Exam: 15%	

Letter grades will be assigned according to the following scale:

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

## Supplementary Class Material

All supplementary class materials will be posted online. Students are expected to regularly check the class's webpage, <http://panda.unm.edu/Courses/morgan-tracy/160/Phys160Spring13.htm>, to find class announcements, homework assignments and due dates, as well as copies of my lectures notes, and homework solutions.

## Course Calendar

Below you will find a listing of the topics covered in this class along with the corresponding text reading and an estimate of how long I believe it will take to cover them. You will be notified in advance of any changes and what portions of the chapters listed below will be covered.

<u>WEEK</u>	<u>DATE</u>	<u>CHAPTER AND TOPIC</u>
1	Jan 14	Ch. 1 - Standards and Units
2	Jan 21	Ch. 2 - Motion Along a Straight Line
	Jan 25	<b>Last day to add the class</b>
3	Jan 28	Ch. 1 - Vectors
	Feb 1	<b>Last day to drop without a grade</b>
4	Feb 4	Ch. 3 - Motion in Two or Three Dimensions
	Feb 8	<b>Last day to change grading option</b>
5	Feb 11	Ch. 4 - Newton's Laws of motion
	Feb 13	<b>Exam 1</b>
6	Feb 18	Ch. 5 - Applying Newton's Laws
7	Feb 25	Ch. 6 - Work and Kinetic Energy
8	March 4	Ch. 7 - Potential Energy and Energy Conservation
	March 8	<b>Exam 2</b>
9	March 11-15	<b>Spring Break - No Class</b>
10	March 18	Ch. 8 - Momentum, Impulse, and Collisions
11	March 25	Ch. 9 - Rotation of Rigid Bodies (continued)
12	April 1	Ch. 10 - Dynamics of Rotational Motion*
	April 3	<b>Exam 3</b>
13	April 8	Ch. 11 - Equilibrium and Elasticity* Ch. 12 - Fluid Mechanics*
	April 12	<b>Last day to withdraw without Dean's approval</b>
14	April 15	Ch. 13 - Gravitation*
15	April 22	Ch. 14 - Periodic Motion*
	April 26	<b>Exam 4</b>
16	April 29	Ch. 15 - Mechanical Waves* Ch. 16 - Sound and Hearing*
	May 3	<b>Last day to withdraw with Dean's approval</b>
	May 8	<b>Final Exam</b>

\* Selected topics to be covered as time permits.