Physics 152
University of New Mexico
Spring 2015

Instructor: Dr. Mark Morgan-Tracy Email: mtracy@unm.edu	Course Number: PHYC 152 Section Number: 003	Meeting Place: CTLB 330 Meeting Time: MWF 12:00-12:50 PM

Office Hours in 109 Regener Hall: Wednesday, 1:30-5:00 Thursday, 1:00-5:00	Office Hours in 114 Regener Hall: Friday, 1:15-3:30

Home Page: panda.unm.edu/Courses/morgan-tracy/152/BAMD152Spring15.htm

Mastering Physics: www.masteringphysics.com

Mastering Physics Access Code: **BAMDPHYC152SPRING15**

Course Description

Welcome to the special BA/MD-program version of Physics 152, the second semester of algebra-based introductory physics. This semester we will be actively covering electricity, magnetism, optics, and modern physics. These topics are the supreme accomplishments of nineteenth and twentieth-century physics and their applications to the technology that we use every day are almost limitless. I hope that you come to appreciate them the way I do.

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: PHYC 151 (Physics I).

Text

The textbook used for this class is the third edition of **College Physics: A Strategic Approach** by Knight, Jones, and Field, Pearson Addison-Wesley, 2015. The second edition

of the textbook will be fine for reading assignments, but you *must* get or already have a third-edition Mastering Physics access code.

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:

- calculate the electric force or electric field for point charges using Coulomb's Law and superposition.
- calculate the electric potential for point charges and simple charge distributions.
- analyze circuits containing combinations of resistors and capacitors using Ohm's and Kirchoff's laws.
- use the right-hand-rule for predicting the direction of the force on a moving charged particle in a magnetic field.
- calculate the magnitude and direction of the magnetic field created by current-carrying wires, current loops, and solenoids.
- apply Faraday's law to predict the induced emf and induced current values in induction problems.
- use Lenz's law to predict the direction of the induced current in a solenoid.
- explain how mutual induction leads to the existence of light.
- predict the intensity of light that has passed through a linear polarizer using the Law of Malus.
- calculate the positions of the constructive and destructive regions in a thin-film, double-slit, and diffraction-grating experiment.
- apply the thin-lens and mirror equations to solve geometric-optics problems.
- use Snell's law to predict the behavior of light upon changing media.
- recognize and draw ray diagrams for simple mirror and lens systems.
- explain the difference between alpha, beta, and gamma radiation.

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 1:30-5:00 and on Thursdays 1:00-5:00. (Please note that if there are many students seeking help we may relocate to a larger nearby room.) On Fridays 1:15-3:30, I will be in room 114 of Regener Hall. 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 Work: In this class, you will actively participate in your learning. I will perform no lecturing during class. Class time will 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. Students will be given training in their group roles during the first week of class. Each worksheet question will be worth one point. Partial credit will be given for any attempted problem. Each group will turn in a single worksheet and each member will be awarded the same score. When determining your average at the end of the term, your three lowest scores will be dropped. **Note:** Students who make a habit of not attending class and miss more than 25% of the total number of worksheets will be given a zero for this portion of their class grade.

Pre-Class: To prepare for lecture, students are expected to read particular sections of the textbook, watch an introductory video, and take an online reading quiz. The specific reading assignments and the videos will both be posted on our class's physics and astronomy webpage (panda.unm.edu/Courses/morgan-tracy/152/BAMD152Spring15.htm). The reading quizzes will be administered on the Mastering Physics website (www.masteringphysics.com). Reading quizzes will consist of three to four questions and will be based on both the reading and the videos. Reading assignments and quizzes will be available shortly after the previous day's class and are due by 10:00 AM of the

current day's lecture. When determining your average at the end of the term, your three lowest reading quizzes will be dropped.

Homework: 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. If you have purchased an access code in the past two years and are using the same textbook, you should be able to login to the Mastering Physics website and enroll in this course. The course ID for this term is **BAMDPHYC152SPRING15**. Unfortunately, if you used a different textbook for Physics I, you will have to purchase a new access code. 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. It is highly recommended that you do *NOT* give up on Mastering Physics problems. The penalty for doing so is always much higher than attempting the problem multiple times.

There is no penalty for looking at and missing questions in hints on Mastering Physics; however, *there is a penalty for giving up and requesting an answer* in a hint!

Exams: There will be four 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, May 8 from 10:00 AM to 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 four** exam grades exceeds the homework average that higher average will be used for your homework score.

Reading Quiz: 5%	In-Class Work: 15%	Homework: 20%	Exams: 45%	Final Exam: 15%

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

Course Calendar

Here is 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.

Week	Date	Topic	Week	Date	Topic
1	Jan. 12	Ch. 20 - Electric Field and Forces	9	Mar. 16	Ch. 24 (continued)
2	Jan. 19	**Martin Luther King Holiday**	10	Mar. 23	Ch. 25 - Electromagnetic Induction
		Ch. 20 (continued)			
	Jan. 23	Last day to Enroll or Change Sections			
3	Jan. 26	Ch. 21 Electric Potential	11	Mar. 30	Ch. 26 - AC Circuits
				Apr. 1	**Exam 3**
	Jan. 30	Last day drop with 100% refund			
4	Feb. 2	Ch. 21 (continued)	12	Apr. 6	Ch. 17 - Wave Optics
	Feb. 6	Last day to change grading option		Apr. 10	Last day to withdraw without Dean's approval
5	Feb. 9	Ch. 22 - Current and Resistance	13	Apr. 13	Ch. 18 - Ray Optics
	Feb. 11	**Exam 1**			
					Ch. 19 - Optical Instruments
6	Feb. 16	Ch. 23 - Circuits	11	Apr. 20	Ch. 28 - Quantum Physics
				Apr. 22	**Exam 4**
					Ch. 29 - Atoms and Molecules
7	Feb. 23	Ch. 23 (continued)	15	Apr. 27	Ch. 30 - Nuclear Physics
				May 1	Last day to withdraw with approval
8	Mar. 2	Ch. 24 - Magnetic Fields and Forces	16	May 8	**Final Exam**
	Mar. 6	**Exam 2**			
-	Mar. 9	Spring Break			