

## Syllabus for Physics 102

- Instructor: Trace Tessier
- Class Time: Tuesday and Thursday 11:00am – 1:30pm
- Location: UNM West
- Office Hours: By arrangement
- Email: [tessiert@unm.edu](mailto:tessiert@unm.edu)
- Text: Conceptual Physics, by Paul G. Hewitt, 10<sup>th</sup> ed.
- Course Website: <http://physics.tsu-li.com/courses/phys102>

*“ $F = m a$  ... Force was equal to mass times acceleration, everywhere, every time: Newton had seen through appearance to a coherent order that was real and eternal ... this equation was a demonstration that behind every tragedy and beyond every possible doubt that there was some core of rationality at the heart of existence. The human mind did not wander forever among vain imaginings: it could find truth sometimes.”*

- Robert Anton Wilson, *The Widow's Son*

*“In the mystery of the universe game, scientists never get to say 'case closed'. Whether they like it or not, they are never really dealing with one mystery, but rather with one small piece of a huge, interlocked series of mysteries. More often than not, once they solve one piece of the puzzle, that solution suggests that old solutions to other parts of the puzzle are wrong, or at least require reexamination. The game of science can accurately be described as a never-ending insult to human intelligence.”*

- João Magueijo, *Faster Than the Speed of Light*

### Course Description

Physics is the most basic of all of the sciences. It is concerned with the nature of basic things such as motion, forces, energy, matter, heat, sound,

light, and the structure of atoms. It is also an ongoing human activity that attempts to describe and explain the order exhibited by nature at the most fundamental level and the causes of that order.

The purpose of this course is to give you an idea of what we know about the fundamental laws that govern the workings of nature, how this knowledge is acquired, and how much still remains to be understood. We will focus especially on applying the known laws of physics to a broad range of different situations in order to achieve a deeper understanding of the fundamental principles governing our universe.

### **Prerequisites**

The only prerequisite for this course is a curiosity about physics. The amount of mathematics in this course will be kept to a minimum. This course is designed so that everyone who puts forth the required effort can do well.

### **Goals**

We will focus on achieving a conceptual understanding of the laws of physics, as well as an appreciation for the scientific reasoning that has led to our current state of knowledge. This is a vast subject that cannot be treated in detail in a one semester course. Our approach will instead be to survey several distinct topics while at the same time learning about the overarching principles that govern these physical processes.

### **Attendance**

My teaching and testing style assume that you attend class on a regular basis. We will cover material that is not in the textbook. This includes information about the latest theoretical and experimental findings and topics presented in several in-class videos. Much of this material will show up on tests. Often I will tell you in class which information from these outside sources you are likely to be tested on. There will also be several in-class exercises designed to reinforce certain topics. Finally, it will sometimes be necessary for me to change a test date or to announce a change to the class schedule. Missing class is not an excuse for not knowing this information.

### **Lectures**

My goal is to make this class both fun and informative and to do this I need your help. **Please turn off your cell phones before coming to class, and please do not participate in side conversations during the lectures.**

Please ask questions at any time during the lecture. If you are confused about something I am probably not doing a very good job of explaining it, so let me know. Most likely, many of the other students share your confusion.

Often I will ask for volunteers to help me with in-class demonstrations designed to illustrate a certain topic. There will also be in-class group work assigned that we will go over in class and will be directly relevant to the tests.

### **Contacting Me**

Email is the best way to contact me to arrange office hours, to let me know that you have had an emergency and will have to miss class for an extended period of time, etc., but not for answering questions about the lecture material. Please use the lectures and office hours for questions of this type.

### **Course Website**

The website for this course is designed to supplement the lectures and to provide curious students with links to additional resources. Please check it often (at least once a week). There is a section called “Course Announcements” which I may use to communicate important information to the class. This section is meant to be a convenience for students, not a comprehensive bulletin board for those who miss class. Do not rely on these announcements to keep you up-to-date if you miss class. Talk with your fellow students.

The website also contains links to a “Downloads” page and a “Links” page. The downloads page contains downloadable versions of this syllabus, a tentative course schedule, and the PowerPoint slides used in lectures. The links page provides easy access to useful physics and UNM websites. Often I will access a website dedicated to a certain topic during class. When I do this I will also post these links on this page for your personal use.

**Note:** The course website is provided for your convenience, but I cannot guarantee that it will be available over the internet at all times. Unavailability of the site is not a valid excuse for poor performance in any aspect of this course.

## **Homework**

There will be regular reading assignments and multiple choice exercises that will help you prepare for the tests, but there will be no graded or turned-in homework. The in-class group activities will also help you to gauge your understanding of the various concepts and to prepare for the tests.

## **Tests**

There will be three tests in this course. Each test will consist of a certain number of equally weighted multiple-choice questions totaling 100 points. None of the tests will be cumulative, but will only include material presented since the last test. **Cheating on the exams will not be tolerated.**

## **Extra Credit**

Attendance will be counted strictly as extra credit. I will divide the number of classes that you attend (maximum of fifteen) by three and add that number to your final grade as calculated above. For example, if you attend all fifteen class periods, then five points will be added to your final grade.

Additionally, if I decide to scale any of the tests in this class, the fraction of the additional points that you will receive will be determined by the fraction of classes that you attend. The rationale is that I scale tests when it seems that I have failed to effectively convey information, but if someone is not present when I try to pass on this information then he/she does not deserve to benefit from the scaling.

To receive credit for a given class period you must attend the entire lecture. Since I am only interested in whether or not you attend class, all absences (excused or not) will be counted as absences. Please note that this is the only extra credit opportunity that I offer.

## **Grading**

Your grade in this course will be an equally weighted average of your three test scores plus your extra credit score.

## **Grading Scale**

Depending on class performance, I may or may not grade according to a curve. Grading on a curve can only improve your grade; it cannot lower it. In any case, I will assign letter grades according to the following scale (rounded to the nearest whole number):

A+	97 – 100	A	93 – 96	A-	90 – 92
B+	87 – 89	B	83 – 86	B-	80 – 82
C+	77 – 79	C	73 – 76	C-	70 – 72
D+	67 – 69	D	63 – 66	D-	60 – 62
F	Below 60.				

### **Dropping This Course**

Unfortunately, there seems to be a trend emerging among academic advisors to tell students doing poorly in a class to petition instructors to drop them after the posted drop deadline to avoid (i) receiving a low grade, (ii) losing a scholarship, and/or (iii) being placed on academic probation. Doing this is in direct violation of UNM policies. **Accordingly, I will not drop a student after the posted deadline for the semester on account of poor performance in this class, regardless of the circumstances.** Each student must evaluate his/her performance in this class and make the decision whether or not to drop prior to this deadline. **Do not assume that I will drop you if you simply stop coming to class and taking the tests; I will not. Be sure to drop the class through the registrar's office.**

**Note:** If you take this class “Credit/No Credit”, according to university policy, your final grade must be “C” or better in order to receive credit.

### **Tutoring**

Free tutoring for this class is available through CAPS. Go to <http://www.unm.edu/~caps/>.

I hope that everyone will enjoy this class and come away with a good feeling about science in general and physics in particular. Good luck and have a great semester!