

Syllabus: Physics of Everyday Objects

Dr. Lawrence Nienart

PHYS 129-1

The class meets every day from 9:00-11:30 in JSC 105

Text: My (under construction and continuous refinement) textbook, available at the college bookstore.

1. My office is in 119 Johnstone Hall. Office Hours : MTWTh; 1:00-2:00 or by appointment

2. 129 Physics of Everyday Objects (3 credits), The “how- and-why” of the working of everyday objects from household appliances and television to the way electricity reaches our homes and how telephone calls are made. The inner workings of cars, ships, airplanes and spacecraft will also be studied. Prerequisite: open only to students with no previous college physics credit.

3. The purpose of this course is to allow the student to truly understand some key physics concepts in the context of how they appear in common objects that everyone is pretty familiar with. Ideally, the student would be able to correctly explain the workings of some object to a student who has never taken the course. Also, the core concepts will prepare the student to understand new things that will become available to everyone within their lifetime. The student will understand these new things using the concepts learned in this class.

4. Learning Outcomes and Assessment:

The successful student will have both broad knowledge of overarching concepts, and more detailed knowledge of many smaller essential things that come up in the course of describing how things work.

These concepts will be tested in a variety of ways. One way is (on occasion) a pre and post test. The pretest when given, will be administered in the first week of class, and the post test will be part of the final exam. Also, every homework and exam will contain questions that test basic knowledge (including some memorization), as well as problems that will see if the student can apply learned concepts to new physical situations. Many (but not all) of these problems involve some mathematics and logical thinking.

5. The class meets every day from 9:00-11:15 in JSC 105 . There will be a 10 minute break midway through class. You must arrive on time-if the weather is bad, leave extra early for class. If you live off campus or at Pine Lake, you are still fully expected to attend class on time. There will be reading assignments in the text, as well as problems posed in class. There will a multitude of demonstrations as well. If you miss a class, you are responsible for all of the material in class. **All material whether in lecture or assigned in the text is fair game on exams.** For this reason attendance is mandatory. **I do not cannot, and will not conduct a repeat lecture in my office for anyone who has missed a class-it is YOUR responsibility to make up the material on your own.** There will be written homework assignments as well that will count to your grade. These must be turned in in a timely manner-they are due the following morning. Late work will not be graded . * If you are having trouble with the homework, you must see me in my office the day before it is due (NOT before class).

Due to the nature of the course, a lot of drawing will be done of the innards of machines, etc. It is highly advisable to bring not only a pen and pencil, but colored pencils/pens to aid in your sketches. This is up to you, of course. You should bring your texts each day too, as I will often just indicate in the text something important that would be too time consuming to draw. A certain amount of mathematics will be done in the course, and a calculator that can do +, -, X, as well as squaring / square-rooting and scientific notation is needed. The physics department will provide calculators for use in class, but you must provide your own for homework, etc. These are available for \$5 or less.

There is a mid-term exam, plus a comprehensive final exam. The percentages associated with these are delineated below. Any exams missed due to sickness or college sanctioned events will be made up by either giving a make-up exam, or by averaging the other exams in place of the missed exam. This will be done entirely at the instructors discretion. The mid term will be held on Wednesday, January 17. The final exam will be on the last day of classes, January 26.

6. The point breakdown for the course is as follows:

Homework	25%
Midterm	35%
Final Exam	40%
Total	100%

Everybody can have a “bad day”. If one does exceptionally poorly on the midterm exam, but does at or above the class average on the final, I will alter the percentages above to more accurately reflect the students true knowledge of material and performance. Consistently bad quiz and exam grades will still give you a bad grade in the course. DO NOT interpret this as I drop the lowest exam grade-that is **not** so. I do not give extra credit assignments, although I might occasionally put one on a quiz or exam.

7. Academic Adjustments and/or Modifications

Hartwick College is committed to the creation of an inclusive and safe learning environment for all students, and welcomes students with disabilities into all the College’s educational programs. The AccessAbility Services Office is responsible for the determination of appropriate modifications for students who encounter barriers due to a disability. If a student with a disability wishes to request academic accommodations, they should contact Lara Sanford, Director of AccessAbility Services and Academic Inclusivity, at sanfordl@hartwick.edu or AccessAbilityServices@hartwick.edu. To serve you best, requests should be made as early as possible. Please let me know if you have questions or need assistance. I am committed to creating a course that is inclusive in its design. If you encounter barriers, please let me know immediately so that we can determine if there is a design adjustment that can be made or if an accommodation might be needed to overcome the limitations of the design. I am always happy to consider creative solutions provided they do not compromise the intent of the assessment or learning activity.

Sex Discrimination, Harassment, and Misconduct Statement:

Please be aware of the following and review as needed:

- **Academic Honesty:** <https://www.hartwick.edu/academics/student-services/academic-affairs/academic-policies/>
- **Title IX/Sexual Misconduct:** <https://www.hartwick.edu/about-us/employment/human-resources/title-ix/>
- **Counseling:** <https://www.hartwick.edu/campus-life/health-wellness/counseling-center/> Counseling Center Phone: (607) 431-4420; Heart Peer Counselors Phone: (607) 431-5050.

8. The course will proceed following the textbook in order. This begins with an introduction to quantities that are of interest to physicists, most of which are familiar to people, albeit in less technical and precise language. The concept of conservation laws will be introduced, a topic that is all-pervasive in physics in general, as well as this course. These concepts will be applied to mechanical objects :“machines”. This will first be illustrated with some simple examples, but things will progress to more complex examples. In successive chapters the core concepts introduced at the beginning of the course will be applied to other interesting objects: engines, common household appliances, electrical devices and so on.

9. Please make yourself aware of the **college policy** on Academic Dishonesty and **missed classes:**

<https://www.hartwick.edu/academics/student-services/office-of-the-registrar/academic-policies-procedures/>

Also, please review the College-wide Missed Class Policy (found at <https://www.hartwick.edu/academics/student-services/office-of-the-registrar/academic-policies-procedures/>).

All students are to turn in their own work. Needless to say, there is no “collaboration” on exams or quizzes. It is almost inevitable that there will be collaboration on homework assignments. I need to see individual assignments turned in, not photocopies, and only one name on a assignment. It should be understood that if one is extensively involved in collaboration, you must make sure you

are actively involved and understand everything. Remember that similar problems will appear on quizzes and exams.

* Exceptions include severe illness or attendance at college sanctioned events (sports, etc.). You need to inform me in advance of any college events. Expect to provide documentation for illness.