

Honors Physics

Goals

- You will focus on learning.
Points and grades often get in the way of this.
- You will develop critical thinking and problem solving skills.
This requires you to take risks, make mistakes, and try again. You should be rewarded for this and not penalized.
- You will know what you understand and demonstrate it to me.
This requires frequent, useful feedback. 8/10 is not useful feedback.
- You will be responsible for your own learning.
This requires you to have the information, tools, and freedom to do so.
- Your final grade will reflect your understanding of the standards for this course.
This requires grades to be associated with standards and you to have multiple opportunities to demonstrate your understanding.

Contact Info

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Office: 150; Classrooms: 143, 144
Available: 1, 2 (2nd half), 5 (lunch)

Materials

- Textbook (covered; name inside)
- Lab Manual (name inside)
- Flash drive
- Scientific calculator (name inside)
- Pen and pencil
- Paper

Units

1st Semester

1D Kinematics
2D Kinematics
Dynamics
Circular Motion
Energy
Momentum
Statics

2nd Semester

Waves
Sound
Electrical Force, Field, Potential, Energy
Electric Current and DC Circuits
Electromagnetism
Electromagnetic Induction & Waves
Geometric Optics
Wave Nature of Light

The Details...

Instructor: Mr. Schmit

I graduated from Case Western Reserve University with my Bachelors of Science and Masters of Science in computer engineering. I earned my Masters in Teaching from National-Louis University. I have worked for 11 years as a software engineer. This is my fifth year teaching full-time. I love exciting students about science, technology, and engineering.

Purpose

The purpose of this course is to contribute to the achievement of the District's Mission, which is to educate students to be self-directed learners, collaborative workers, complex thinkers, quality producers and community contributors; and to master the standards that comprise this physics course. To achieve this, you will develop a conceptual understanding of our physical world. You will learn how to think critically, solve challenging problems, and reflect on your understandings. Through this process you will become better prepared for the structure of college classes and the expectations placed on professionals in the workplace. This is a demanding course designed for college-bound students interested in science and, potentially but not necessarily, planning a career in science or engineering. We use a college text, but move at a slower pace than a college course. After you complete two semesters of Honors Physics and one semester of Advanced Physics (offered in the Spring), you have completed the equivalent of an algebra-based college physics course and are prepared for the AP Physics B exam.

Learning Activities and Summative Assessments

You develop mastery of the learning standards for this physics course by completing a variety of learning activities such as homework reading, questions, and problems; whiteboarding in groups; and lab activities. While these activities don't directly affect your grade, they are essential in that they are your opportunity to explore, discover, take risks, make mistakes, ask questions, help each other, practice, and get feedback before having to demonstrate mastery. You demonstrate your mastery through summative exams at the end of the unit and labs throughout the unit. Your grade directly reflects your demonstration of mastery.

- I. **Homework Reading, Questions, and Problems.** The standards calendar lists the learning standards for each day and reading, questions, and problems to be completed as homework that night to reinforce or practice those standards. For example, if the following appears under a given learning standard: *R: 4; Q: 3, 5, 9; P: 9, 18*; the homework is to read section 4 of the current chapter; answer questions 3, 5, and 9; and solve problems 9 and 18. Usually, the homework for a given night is split across multiple learning standards. Some homework is not associated with a learning standard and is listed in italics. Homework is both a learning activity and a summative assessment as another medium through which to demonstrate mastery. You demonstrate mastery by solving the homework problems through the WebAssign web site (<http://webassign.net/>). You must complete the specified percentage of the homework problems by the morning of summative exam. You have multiple attempts to answer each problem. If additional attempts are required, please let me know. Please note that each student receives slightly different WebAssign problems and, therefore, your answers may be unique. Also note that the problem numbers in WebAssign are not the same as those in the text but are sequential. The standards calendar always refers to the the problem numbers in the text.
- II. **Whiteboarding.** Whiteboarding consists of small groups preparing on a whiteboard their solution to a previously assigned homework problem that they sign up for on the front board. One member of the group, often chosen at random, then presents their group's solution to the rest of the class and leads the class in a discussion of that solution. The questions that are asked, debated, and

answered during the discussion is critical to the learning of the class. There is not time in class to figure out how to solve your group's problem; so, it is essential that you have at least made a valid attempt at solving these problems before class. Problems that are whiteboarded are solved with the values as specified in the text which may be different than those in WebAssign.

- III. **Lecture, Demonstrations, and In-Class Worksheets:** At times, I will introduce new concepts by presenting the new material with a lecture or demonstration. There are in-class worksheets for most units. Sometimes, I will model how to solve problems by leading the class through problems on the in-class worksheet. Other times, you will work in your group to solve in-class worksheet problems.
- IV. **Lab Activities.** At times, you will explore new concepts in a lab activity and we will discuss our observations and results after the activity. You will develop mastery of many learning standards through these activities and associated activity reports. This is an excellent opportunity to practice and receive feedback on your understanding. Usually, activity reports are due the day after the activity. If you submit the activity report late, you may not receive feedback before the summative exam.
- V. **Lab Practicums and Lab Reports.** You will demonstrate mastery of some learning standards through the completion of lab practicums and lab reports. The standards calendar will specify which learning standards are being assessed for that lab practicum or report. In general, you will complete one lab practicum and report for each unit. Usually, formal reports are due two days after the lab.
- VI. **Summative Exam.** You will demonstrate mastery of most learning standards through summative exams. Summative exams are a combination of multiple choice and free-response problems. You are allowed to use a calculator and the AP Physics B Table of Information and Equation sheets. You must show all your work to earn credit on free-response problems. Your work, rather than the final answer demonstrates mastery. That is, you can demonstrate mastery of a learning standard even though you obtained the wrong answer if you have the correct process. Similarly, you cannot demonstrate mastery if your process is incorrect even though your final answer is correct. On the multiple choice exam, you must answer a certain number of the questions associated with a specific learning standard correctly in order to demonstrate mastery of that standard. If you do not take the exam with the class, you will take a make-up version of the test that is different from the original.
- VII. **Second Tries.** If you are still developing mastery after the summative exam, you may, at my discretion, have another opportunity to demonstrate mastery by attempting a "second try." Please note that second tries are designed to be at least as challenging as the summative exam. Therefore, before you attempt a second try, you should complete additional practice to prepare. You are responsible for determining and completing the additional practice. Second tries are usually offered on Thursdays before and after school. Second tries for a given unit are usually offered for a period of two weeks following the summative exam. Usually, second tries are not available for lab practicums, but corrections may be made on formal lab reports.
- VIII. **Final Exam.** Your final opportunity to demonstrate mastery is on the final exam. If you demonstrate mastery for learning standards on the free response portion of the final exam, it also counts as demonstrating mastery during the semester. The multiple choice portion of the exam will be comprehensive but will not be organized by standard and will not be an additional opportunity to demonstrate mastery. It will only contribute to the 20% weight of the final exam.

Communication

Learning activities and summative assessments are enumerated on the standards calendar for each unit. Class information is posted to the web site. The web site also hosts a forum in which only we (i.e., students and physics teachers) can ask and provide answers to questions. To fully access the web site, you need to login with your school login user name and a password which you will be provided. Please feel free to visit me in my office or classrooms when I don't have class. If you let me know in advance that you are coming, I will ensure that I'm there. If you can't arrange to talk with me in person and you don't wish to post your question on the web forum, e-mail is an excellent way to reach me. I will respond the same night to all messages that are received by 9 p.m.

Class Expectations

- We help each other learn.
- We respect each other's learning. For example:
 - We have our materials and are learning from the bell until I dismiss the class.
 - We handle lab equipment, text books, and lab manuals with care.
 - We accept and respect each other's differences.
 - We help create a safe environment in which we all feel comfortable asking questions.
- We have misconceptions about science that we wish to overcome.
- While you are encouraged to collaborate on assignments, all assignments must be your original work. Assignments that are identical, either in whole or in part, result in no evidence of mastery. This affects everyone who has identical assignments regardless of who may have done the original work. Referrals may also be written.
- Cheating or plagiarizing will result in no credit and a referral to your Dean.
- If you are absent, you are responsible for obtaining handouts and notes and then also checking with me to make arrangements for extra help or to make-up exams, labs, or activities. Exams may be made up on Thursdays either before or after school by arrangement.

Grading

Grading is done on an individual basis, you are not competing with your classmates, and there is not a curve. All questions about specific grades will be discussed outside of class. The semester grade and the final exam grade is determined by the percentage of learning standards that you have mastered (standards assessed with free response questions count double):

A: 100% - 90% B: < 90% - 80% C: < 80% - 70% D: < 70% - 60% F: < 60% - 0%

The cumulative grade is determined by a combination of the semester grade (85% weight) and the final exam (15% weight). Grades of A, B, and C are counted as weighted grades.