

Honors Physics
Mr. Brownell
Torah High School 2024-2025
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Schedule

Tuesday and Thursday 1:10-1:55pm
Room 307

About This Class

Physics is a broad field studying the interactions of matter and energy. That is quite broad, so this year we will only introduce a limited number of topics within the broader subject. This class will focus on what I like to call “physics at the human scale”, meaning we are studying motion and interactions that you can observe in daily life. It is also the branch of physics which is most important to understanding the physical world and how we interact with it. This isn’t just important for scientists and engineers but helps all people of the world to make informed decisions.

Contact

Please talk to me if you ever have questions, concerns, or any other academic topic to discuss. And if one of your classmates knows the answer they can help, and everybody will get to benefit from the question and answer. If you have a question or concern that you want to keep private, then please send me a message through email.

Learning Objectives - Currently Planned for Fall: At the end of this semester, you will be able to:

1. Use kinematic equations to quantitatively describe motion with constant acceleration.
2. Explain Newton’s Laws of Motion qualitatively.
3. Use Newton’s 2nd law to relate forces to motion.
4. Describe kinetic and static friction, both qualitatively and quantitatively.
5. Use work and energy to solve problems involving gravity, springs, and friction.
6. Explain how friction and air resistance act on objects and change the mechanical energy of systems.
7. Quantitatively describe collisions using momentum conservation.
8. List the rotational analogues to linear motion and describe similarities and differences.
9. Apply the principles and mathematics previously used on linear motion to rotational motion.
10. More to come!

Grading

We will use the following grading scale for the class:

- A: 90% - 100%
B: 80% - 89% C: 70% - 79%
D: 60% - 69%
F: < 60%

Grades will be determined by:

In class assignments & class project: 30%

Homework: 40%

Tests and quizzes: 30%

Homework is an important part of learning because it provides a chance for you to practice your problem-solving skills. We will have 2 different types of homework throughout the year:

1. **Reading Quizzes (RQ):** primarily short assignments that will ask about definitions and simple mathematical problems. These questions will come from assigned reading or notes in class. There will be a due date set through WebAssign, and I will not accept these late.

2. **Homework (HW):** includes problems which will require calculations and writing out explanations. Homework sets will have a due date specified on WebAssign, and it needs to be submitted by 11:59 pm on the due date. Late homework will be accepted through WebAssign's "Extension" feature at a 30% penalty (maximum score of 70%). Keep in mind things can pile up quickly if you fall behind. If there is a serious issue that prevents you from finishing homework (medical issues, family emergency, etc.), please let me know so we can work around that. I want to help you be successful, but I cannot help with a situation that I don't know about.

In class activities will include a few different items that will all be graded largely on completion. As the name implies, they will be done during class. Most will be collaborative activities, so there will be good opportunities to work together and help each other attain mastery of a subject.

1. Worksheets for additional problem-solving practice.
2. Online simulation activities
3. Lab and demo questions
4. Possibly more

During the year we will have 6 Quizzes, a Midterm exam in December, and a Final Exam in May. The quizzes and exams will be announced ahead of time, and I will tell you the topics each focuses on. There will be no "pop" quizzes. Exams will be open note, but don't think that means they will be easy! I don't want you to feel like there is a pile of facts and equations to memorize. Instead, you will need to apply what we have done in class to novel questions.

The project will be a presentation about a topic of your choice. We will talk more about that in the spring, so don't worry about it just yet.

Class Text

Instead of a conventional textbook, we will use a free text (OER) provided by OpenStax.org. We will follow the order of material in the text and use the same notation throughout. I encourage you to refer back to this regularly while doing homework and studying for exams. There may be assigned reading to go with a WebAssign homework assignment.

Academic Integrity

You are allowed to, and even encouraged to, discuss the homework with your classmates, as talking through physics problems with somebody else can really help improve learning. The work that you turn in must be your own and you must show your work for any mathematical problems. If I see evidence of cheating, I will notify the School Administration and follow the school's protocol for academic integrity violations.

Cheating on homework could involve copying a classmate's homework or copying an online solution. A student who cheats deprives themselves of a chance to learn the material and will fall behind later in their academic career. If you are struggling with your homework, please come and talk to me. I want you all to succeed in this class and I will offer whatever support I can to help.

Exams must be taken alone, and other in-class assignments will be clarified as individual or group work when assigned.