Physics Syllabus

The Classical Academy

2022-23

**Mr. Abrams** dabrams@asd20.org Classroom: 1117 Phone: 484-0091 ext. 1117

Welcome to Physics! I look forward to getting to know each of you and in working with you to expand your understanding of how our universe works. This year, you’ll use familiar math tools such as trigonometry and algebra to solve various physics problems. More importantly, you will learn how to model these problems to more easily solve them. There's even a chance that we’ll have fun along the way.

Course Goals

Learn, understand, and apply physics models to understand, describe, and predict physical behavior.

Course Description:

Physics is the study of the relationships and interactions between matter and energy. As such, the study of physics is considered to be foundational to the other classical sciences. This class includes the study of motion, forces, light and sound waves, electricity and magnetism, and nuclear energy. Students will learn the major laws of classical physics, learning how to apply these laws to explain and predict the behavior of matter and energy in a wide variety of conditions. Students will appreciate how the complexity of nature can be described by a relatively few number of principles and laws. Regular laboratory work within class will help the students apply the principles they learn.

Expected Course Outline:

* Math, Units, and Measurement
* One- and Two-Dimensional Motion
* Forces and Newton’s Laws of Motion
* Work and Energy
* Momentum and Collisions
* Circular Motion and Gravity
* Fluid Mechanics: Buoyancy
* Vibrations and Waves
* Sound
* Light: Reflection, Refraction, Diffraction
* Electric Forces and Fields
* Current and Circuits
* Magnetism
* As time allows:
  + Heat and Thermodynamics
  + Electromagnetic Induction
  + Atomic, Quantum, and Nuclear Physics
  + Theory of Special Relativity

Textbook:

Young, David and Stadler, Shane. *Cutnell & Johnson Physics, 10e*. John Wiley and Sons, 2015.

Required Supplies:

* College-ruled paper for notes and homework assignments
* Several #2 pencils (may be mechanical) with good erasers
* Ink pens (non-erasable) for labs and homework grading
* Whiteboard (Expo) markers for personal whiteboard use
* A good graphing calculator (such as the TI-83 or TI-84)

Homework Policies:

* Expect homework (including pre- and post-labs) to be assigned nearly every day. Unless explicitly stated otherwise, homework is due at the beginning of the next class day.
* Homework should be accomplished in pencil, written legibly, on 8.5 x 11 paper.

Quiz and Test Policies:

* Expect regular quizzes that cover the material covered in class, labs, and homework.
* Quizzes and tests will always be announced at least one lesson in advance of the date they are given.
* Missing a review day prior to a quiz or test does not excuse you from on-time testing.

Labs and In-Class Exercises

Regular labs are scheduled to give you hand-on experience with the physics concepts we discuss in class. Many labs will require a pre-lab to be accomplished and most will require a post-lab write up. Although data collection will take place in a group, you will be expected to complete the rest of the lab on your own.

Estimated Grading Percentages

Homework and Labs: 30% Quizzes: 20% Tests: 30% Final: 20%

Class Expectations:

Come prepared to succeed: homework done; pencil, paper, and cranium ready for action.

Demonstrate respect at all times, especially to your fellow learners. Strive to maintain a positive attitude.

I expect every student to be **on time**, **in uniform**, and **prepared for class** every day. Failure to do this will result in appropriate discipline.

Extra Help

I am generally available during flex time and after school in Room 1117 for anyone who needs extra help. Dropping by unannounced is okay, but I recommend coordinating your visit beforehand to make sure I’ll be there.