CHELMSFORD HIGH SCHOOL

Physics CP SYLLABUS
2023-2024

COURSE DESCRIPTION

High School Physics standards expect students to apply a variety of science and engineering practices to three core ideas of physics:

1. Motion and Stability: helps students answer the question, "How can one explain and predict interactions between objects and within systems of objects?" Students are able to demonstrate their understanding by applying scientific and engineering ideas related to Newton's second law, total momentum, conservation, system analysis, and gravitational and electrostatic forces.
2. Energy: develops students' understanding of energy at both the macroscopic and atomic scales, and helps students answer the question, "How is energy transferred and conserved?"
3. Waves and their Applications: technologies for information transfer support students' understanding of the physical principles used in a wide variety of existing and emerging technologies, which helps students answer the question, "How are waves used to transfer energy and send and store information?"

Lab investigations, demonstrations, and collaborative activities are designed and structured for each level offered within the curriculum.

Prerequisite(s): Successful completion of any level of Algebra 1 and Biology.

REQUIRED TEXTS

Conceptual Physics: The High School Physics Program - Hewitt.

COURSE GOALS and STUDENT LEARNING OUTCOMES:

By the end of the course, students will be able to answer the following questions

- How does the understanding of electric charges allow us to better understand natural phenomena?
- How do electric currents impact our everyday life?
- In what ways does the relationship between electricity and magnetism impact the development of the technology we use?
- Why is it important that the motion(s) of an object(s) be described and predicted?
- What is the relationship(s) between the descriptors of motion?
- In what ways do forces and the properties of bodies affect changes in motion?
- How is the motion of objects explained, described and predicted by energy transformations?
- How does our understanding of Conservation of Energy allow us to better experience the world around us?
- How does momentum influence the interaction of bodies?
- Why are waves an efficient way to transfer energy and information?
- How are light waves and sound waves similar? Different? What causes their properties?

COURSE STANDARDS
DESE STANDARDS LINK

PERSONS WITH DISABILITIES
Chelmsford High School is committed to supporting the success and well-being of all students, regardless of varying abilities and levels of adaptive skills. The Special Education office provides services and resources to empower each student to attain their highest level of academic success and learning independence.

ACADEMIC INTEGRITY
At Chelmsford High School, students are expected to maintain high moral and ethical standards, as exemplified by the final sentence of our mission statement: "*A spirit of respect is fostered, as members take responsibility for their actions and acknowledge the rights and differences of others.*" (CHS Mission Statement)

Students should respect themselves, other students, staff members and the school. The acts of cheating and plagiarism violate expectations that students will exhibit respectful, ethical behavior.

The Academic Honor Code exists to address the issues of cheating and plagiarism.

GRADING POLICIES
Please connect with individual teachers for specific information regarding grading. Students will be able to monitor academic progress biweekly through X2/ASPEN.

Students are strongly encouraged to take advantage of the academic support programs and services (such as PRIDE Block, after-school help, etc.) available to them to help ensure and support success. Information about these services can be provided by your teacher, guidance counselor, or administration.

COURSE SKILLS
The following skills are addressed in this course:

- Visual Representations - Analyze and/or use representations of physical situations, excluding graphs.
- Questions and Method - Determine scientific questions and methods
- Representing Data and Phenomena - Create visual representations or models of physical situations.
- Data Analysis - Analyze quantitative data represented in graphs.
- Theoretical Relationships - Determine the effects on a quantity when another quantity or the physical situation changes.
- Mathematical Routines - Solve problems of physical situations using mathematical relationships.
- Argumentation - Develop an explanation or scientific argument.

COURSE OUTLINE
Physics is divided into 4 overarching units:

Unit 1: Electricity and Magnetism
Unit 2: Kinematics and Newton's Laws of Motion
Unit 3: Work, Energy and Momentum
Unit 4: Vibrations and Waves

This syllabus and course outline are subject to change as Chelmsford High School seeks to continually improve the learning experiences for all students.

"We foster PRIDE* in our pursuit of excellence."

PRIDE refers to our five core values – Perseverance, Respect, Integrity, Dedication, and Empathy. These five pillars represent our points of emphasis in supporting the development of quality students and quality citizens.