



# CHELMSFORD HIGH SCHOOL

## AP Physics C - Mechanics SYLLABUS 2023-2024

### **COURSE DESCRIPTION**

This is an in-depth, mathematically rigorous, course in physics that is equivalent to the depth, time, and rigor to a first semester college course in calculus-based Physics. The course is designed to prepare students for future study in the core science areas (biology, chemistry or physics), mathematics or other professional fields such as pre-med, pre-dental, veterinary study or engineering. It is also designed for all science majors and other students wishing to demonstrate their ability to meet the challenge of an advanced placement course. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power. Projects, technical writing and lab work play an important role in this course. Homework will be approximately one hour per night and will average 4 days per week.

*Prerequisite(s): Successful completion of Honors Physics or current Science teacher recommendation, co-enrollment AP Calculus.*

### **REQUIRED TEXTS**

[Open Stax University Physics \(Volume 1\)](#)

### **COURSE GOALS and STUDENT LEARNING OUTCOMES:**

By the end of the course, students will be able to...

- Understand how to quantify and model systems involving motion in 1D, 2D and rotation.
- Understand and apply Newton's laws of motion and gravitation.
- Understand and apply the laws of conservation of momentum and conservation of energy.
- Understand and apply the laws of conservation to fluid mechanics.

### **COURSE STANDARDS**

[College Board Course and Exam Description](#)

### **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**

AP Physics C Mechanics is divided into 9 units:

Unit 1: Kinematics 1D

Unit 2: Kinematics 2D

Unit 3: Force

Unit 4: Work & Energy

Unit 5: Momentum

Unit 6: Rotation

Unit 7: Oscillations

Unit 8: Gravitation

Unit 9: Drag Forces

*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.**