



CHELMSFORD HIGH SCHOOL

AP CHEMISTRY SYLLABUS

2023-2024

COURSE DESCRIPTION

10 Credits (#24013), Grades 11 + 12, Lab-based

After a review and enrichment of major concepts from first year chemistry, this second year Chemistry course provides an intensive study of selected topics in chemistry. Included among these are: nuclear chemistry and organic chemistry; reaction kinetics, acid/base equilibrium; thermodynamics; and electrochemistry. The student must be self-motivated and industrious. There are extensive homework assignments and frequent laboratory reports to write that will require 1-2 hours of work each day. Much of class time will be spent in the lab with time allotted for answering questions. This is a full year course. Students will be required to complete chemistry work over the summer prior to the beginning of the school year.

Prerequisite: Successful performance in Honors Chemistry

REQUIRED TEXTS

Chemistry, A Molecular Approach 4th edition, by Nivaldo J. Tro

COURSE GOALS and STUDENT LEARNING OUTCOMES:

By the end of the course, students will be able to incorporate mathematical skills in the solution of chemistry problems, both through the use of textbook problems and laboratory activities. Students will be required to do extensive writing, and to keep a thorough and accurate ongoing laboratory notebook.

COURSE STANDARDS

<https://apstudents.collegeboard.org/courses/ap-chemistry>

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:

- Designing experiments and procedures to test a prediction or theory
- Creating graphs, diagrams, and models that represent chemical phenomena
- Explaining how the microscopic structure of a substance determines its chemical properties
- Balancing a chemical equation
- Making a scientific claim and supporting it with evidence

COURSE OUTLINE

AP Chemistry is divided into 9 units:

Unit 1: Atomic Structure and Properties

- Students will learn about the composition of atoms and ways scientists measure and categorize these molecular building blocks.

Unit 2: Molecular and Ionic Compound Structure and Properties

- Students will discover the range of chemical bonds and how their structure can affect the properties of the molecules created.

Unit 3: Intermolecular Forces and Properties

- Students will explore how atoms come together to create solids, liquids, and gases, and how subatomic forces govern the properties of everything around you.

Unit 4: Chemical Reactions

- Students will learn how to differentiate physical and chemical processes, and how to measure and express chemical reactions via chemical equations.

Unit 5: Kinetics

- Students will explore various methods to observe the changes that occur during a chemical reaction and the effects of a series of reactions.

Unit 6: Thermodynamics

- You'll learn about energy changes in chemical reactions and how a transfer of energy can change a substance's physical qualities.

Unit 7: Equilibrium

- Students will chart how chemical reactions change over time, what causes substances to reach

equilibrium, and how systems react when that equilibrium is disturbed.

Unit 8: Acids and Bases

- Students will learn more about pH, the qualities and properties of acids and bases, and how they interact in chemical reactions.

Unit 9: Applications of Thermodynamics

- Students will be introduced to the concept of “thermodynamic favorability” for reactions, meaning how likely they are to occur given energy changes and environmental factors.

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.