



CHELMSFORD HIGH SCHOOL

Chemistry H SYLLABUS

2023-2024

COURSE DESCRIPTION

10 Credits (#24213, #24223), Grades 10 + 11, Lab-based

The major focus of chemistry is on matter and its interactions. Quantitative and qualitative methods can be used to explain how matter interacts. Fundamental basics of matter are determined by the structure of atoms and the compounds they compose. Reactivity and properties of compounds are explored through a variety of inquiry-based laboratory activities. Topics covered include: atomic theory, stoichiometry, gas laws, bonding, solutions, and thermodynamics. Honors Chemistry is a full year course created for students who have demonstrated a sincere interest in the sciences with students independently using algebra skills in the context of the chemistry curriculum. Honors students should expect to have 1-2 hours of independent work per night. Chemistry CP provides a foundational understanding of chemistry and may be taken as a Dual Enrollment course with Middlesex Community College as a general science credit (CHE 121).

Prerequisite for Honors: Successful performance in Honors Biology, successful performance in an Honors level Algebra-based Mathematics course or advanced performance in CP algebra-based mathematics course, teacher recommendation.

REQUIRED TEXTS

Chemistry (6th Edition), Zumdahl & Zumdahl

COURSE GOALS and STUDENT LEARNING OUTCOMES:

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

- consider how structure and composition at sub-atomic scales explain structure-property relationships in chemistry and influence energy transformations and dissipation of energy during chemical and physical changes.
- apply mathematical reasoning when considering conservation of matter in chemical reactions and in comparing strength of acid-base solutions.
- develop both molecular and sub-atomic models of matter and learn to rely on the periodic table as a powerful model for predicting a wide variety of properties of elements and compounds.
- reason about timescales in the context of a collision theory model, and consider how altering external conditions, chemical concentrations, and ways of introducing reactants to a system can be manipulated to control chemical processes.
- refine their understanding of conservation of matter by making quantitative predictions of theoretical yields if reactions are driven to completion using stoichiometric molar proportions and molar mass calculations.
- practice using two major models of reaction processes, the Bronsted-Lowry acid/base reaction model and the oxidation-reduction reaction model, to explain reaction patterns observed in many common phenomena in the natural world.

COURSE STANDARDS

<https://www.doe.mass.edu/frameworks/scitech/2016-04.pdf>

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

1. Asking questions (for science) and defining problems (for engineering)
 2. Developing and using models
 3. Planning and carrying out investigations
 4. Analyzing and interpreting data
 5. Using mathematics and computational thinking
 6. Constructing explanations (for science) and designing solutions (for engineering)
 7. Engaging in argument from evidence
 8. Obtaining, evaluating, and communicating information
- The following skills are addressed in this course:

COURSE OUTLINE

Chemistry H is divided into 10 units:

Unit 1: Chemical Foundations

Unit 2: Atoms, Molecules and Ions

Unit 3: Stoichiometry

Unit 4: Aqueous Solutions

Unit 5: Gases

Unit 6: Thermochemistry

Unit 7: Atomic Structure and Periodicity

Unit 8: Bonding
Unit 9: Solutions
Unit 10: Acids and Bases

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.