

# Montclair High School

## Course Syllabus

**Department: Science**

**Course: Chemistry**

**Level: Honors**

**Credits: 6**

### Course Description:

This is a course for students who are interested in an extensive overview of the theories and practical applications of chemistry. A minimum of two periods per week will be spent in the laboratory with the remainder of time devoted to lecturing and problem solving. Students can expect a heavy emphasis on mathematics; it is therefore suggested that students have a strong background in algebra and other upper level math skills, including derivations and multi-step computations. Summer assignment completion may be required prior to taking the course.

### Standards:

HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-6, HS-PS4-3, HS-PS3-4

### Anchor Text(s):

Text Title	Publisher/Author	Year/Edition	ISBN	Text Distribution
Chemistry: Matter & Change	Glencoe McGraw Hill/ Buthelezi, et. al.	2008	978-0-07-874637-6	Hard copy, <a href="#">PDF copy</a> , & <a href="#">online text</a> available

### Supplementary Materials:

- <http://www.learner.org/resources/series61.html> World of Chemistry Instructional Series
- Frostburg State University Chemistry Department, available online at <http://antoine.frostburg.edu/chem/senese/101/tutorials/index.shtml>
- my.hrw.com - online edition of an alternative textbook, by password
- [www.sciencegeek.net](http://www.sciencegeek.net)

### Units of Study:

- Measurement and math in science
- Matter
- Atomic theory
- Periodic table
- Quantum-mechanical theory
- Chemical reactions and stoichiometry
- Gas laws
- Chemical bonding
- Properties of solutions
- Kinetic theory
- Thermochemistry

- Acid-Base chemistry
- Equilibrium & reaction rates
- Oxidation-reduction chemistry
- Electrochemistry
- Nuclear chemistry

### **Proficiencies:**

By the end of this course, students will:

1. Explain chemistry in terms of regularities and models that apply to matter, with an emphasis on formula writing.
2. Use basic chemical terminology and understand that there are several bodies of knowledge that constitute the field of chemistry (general, organic, inorganic, biochemical, physical).
3. Logically gather, order and interpret data through an appropriate use of observation, measurement and tools.
4. Understand and employ the scientific method in experimental situations and implement rules of lab safety.
5. Understand the parts of the atom.
6. Understand how atomic theory has evolved from the Ancients through to modern theory.
7. Have the ability to distinguish among elements, compounds and other categories of matter.
8. Solve mole and mass problems using Boyle's Law, Charles' Law, Combined Gas Law, Ideal Gas Law and Dalton's Law.
9. Explain the rates, heats of reaction and thermodynamic relationships, especially in industrial and technological terms.
10. Compare and contrast physical, chemical and nuclear changes.
11. Illustrate how chemical systems control the natural and man-made world.
12. Understand equilibrium, oxidation-reduction reactions and acid-base chemistry by using exponents and logarithms.
13. Graphically represent a variety of data and or chemical relationships.
14. Develop algorithms to describe chemical patterns/theories/laws.
15. Solve problems that involve various units and perform dimensional analysis, especially English /Metric conversion.
16. Identify major contributors to the field of chemistry of various cultures and ethnic backgrounds.
17. Provide a historical context for the evolution of science and technology from a chemical prospective.
18. Identify two potential career paths that can be taken in the field of chemistry.

### **Evaluation & Assessment:**

- Test/Quizzes 60%
- Labs/Project/Homework 40%

The Final Grade will consist of each marking period (22.5% each), the midterm exam (5%) and the final exam (5%)

Prior to beginning any lab activities, all students must have submitted a Safety Contract which has been duly signed by both the student and their parent/guardian. This contract will be kept on file by the teacher for the duration of the course.