



## Online Courses for High School Students

1-888-972-6237

### Chemistry

#### **COURSE DESCRIPTION:**

In this course, you will learn what matter is made of. By matter, we do not mean just rocks or chemicals. We mean everything - even you. You will explore the unseen world of atoms and molecules, the building blocks of the universe. You will be able to understand what makes one form of matter different from another.

#### **COURSE OBJECTIVES:**

After completing this course, students will be able to:

- State the general purpose for the study of chemistry.
- List several fields of study where knowledge of chemistry is important.
- Use scientific units of measurement.
- Describe the structure and components of basic atoms.
- Use the periodic table to locate important chemical information.
- Describe several types of chemical bonds.
- Manipulate common chemical formulas and equations.
- List and describe types of chemical reactions.
- List some physical characteristics of common gases, liquids, and solids.
- Describe the behavior of solutions and ions.
- Describe reaction energy and reaction kinetics.
- Discuss important aspects of nuclear chemistry.

**PREREQUISITES:** None

**COURSE LENGTH:** Two semesters

**REQUIRED TEXT:** None

**COURSE OUTLINE:**

### **Chemistry Fundamentals:**

- States of matter solids, liquids and gases
- Changes of matter physical and chemical changes
- Matter, mass, volume, and weight
- Chemical and physical properties
- Classification of matter homogeneous, heterogeneous, mixture, compounds, and elements

### **The Scientific Method:**

- Scientific method
- Qualitative and quantitative measurements
- SI System
- Conversion factors
- Derived units
- Accuracy and Precision
- Significant Figures
- Energy and Specific Heat

### **Atoms & the Periodic Table**

- History of the atom
- Structure of the atom
- Atomic number, mass number, and isotopes
- Quantum numbers
- Electron configurations
- History of the periodic table
- Organization of the periodic table
- Metals, nonmetals, and semimetals
- Periodic table group characteristics
- Trends in the Periodic Table: atomic radius, ionization energy, electronegativity and electron affinity

### **Ionic Compound**

- Octet rule
- Ionic bonding
- Metallic bonding
- Covalent bonding
- Polar and nonpolar covalent bonds
- Naming ionic and covalent compounds

- Writing formulas for ionic and covalent compounds

### **Mole and Chemical Composition**

- Calculating formula and molecular mass
- The mole
- Converting moles to grams
- Converting grams to moles
- Converting moles to number of particles
- Converting number of particles to moles
- Converting grams to number of particles
- Converting number of particles to grams
- Percent composition
- Determining empirical formulas
- Determining molecular formulas