



Honors Chemistry

2014-2015

Course Description:

HONORS CHEMISTRY is an intensified introduction to the discipline of chemistry. All topics covered in the standard chemistry course are included but are studied in greater depth and with increased emphasis on interrelationships between the topics and problem solving.

In the solution of problems, students will need to employ higher levels of mathematical and abstract reasoning skills than in the standard course.

Course Content:

Unit 1. Matter, Measurement and Calculations

A. Matter

1. Development of chemistry
2. The Scientific Method
3. Branches of Chemistry

B. Measurement, Accuracy, and Precision

1. Metric and SI systems
2. Significant figures; experimental error
3. Scientific notation
4. Calculations using significant figures and scientific notation

C. Factor-label technique

1. Unit conversion
2. Derived units
3. Temperature units

Unit 2. Matter and its Changes

A. Matter and energy

1. Definitions
2. Fundamental laws and relationships

B. Properties of matter

1. Physical
2. Chemical
3. Intensive
4. Extensive

C. Changes in matter

1. Physical
2. Chemical
3. Energy and changes in matter

D. Classes of matter

1. Heterogeneous vs. homogeneous mixtures

2. Solutions and substances
3. Elements, compounds, and mixtures
4. Classes of elements

Unit 3. The Structure of Matter

A. Atomic Structure

1. Nucleus
 - a) neutrons and protons
 - b) ions and isotopes
2. Electrons

B. Electromagnetic spectrum

1. Basic relationships
2. Bohr atom equations
3. Evolution of the model of the atom

C. Electron cloud

1. Quantum theory
2. Electron notations

Unit 4. Periodic table and Nomenclature

A. Periodic Table

1. History of Periodic Table
2. Properties of metals vs. nonmetals
3. Periodic Trends

B. Formulas and Equations

1. Chemical bonding
 - a) ionic bonding
 - b) covalent bonding
2. Chemical compounds
 - a) writing formulas
 - b) nomenclature

Unit 5. Stoichiometry

A. Particle and mass relationships

1. Avogadro's number and the mole
2. Atomic mass and molar mass
3. Single replacement reactions

B. Chemical formulas

1. Percent composition
2. Empirical formula
3. Molecular formula

C. Chemical reactions

1. Balancing equations - Law of Conservation of Mass
2. Mass-mass calculations
3. Limiting reactants
4. Percent yield

D. Predicting products of reactions

1. Single replacement
2. Double replacement
3. Decomposition
4. Combustion

Unit 6. Solutions, Ionic Equations, and Redox Reactions

A Solutions

1. Strong and Weak Electrolytes
2. Concentration and Dilution

B. Writing Chemical Equations

1. Molecular equations
2. Net ionic equations
3. Using solubility rules

C. Oxidation and Reduction

1. Oxidation numbers
2. Balancing redox equations

Unit 7. The Gaseous State

A. Gas Behavior

1. Kinetic theory of gases
2. Pressure, temperature volume variables
3. Gas laws, combined gas laws, and ideal gases
4. Dalton's law of partial pressures

Required Textbooks and/or Other Reading/Research Materials

Students will be using an online textbook, which they will be able to access from any computer.

Introductory Chemistry: Concepts and Critical Thinking, 6th Edition by Charles H. Corwin.. Pearson Prentice Hall, ©2011.

Course Requirements:

Each student is required to complete all tests, labs, and assignments. Failure to do so will affect the student's overall grade. A scientific calculator is required for this course. Students should come prepared to every class period by bringing their homework, 3-ring binders, pen/pencil, and a calculator.

If a student is absent from class, it is his/her responsibility to check on the teacher's website for missed work and to promptly make up that work. Refer to the policy in the student handbook for timelines to make up missed work and assessments.

Grade Components/Assessments:

Grades will be weighted based on a category percentage. Sapphire will automatically give a student's grade as a weighted percentage based on the following category percentage breakdown:

Assessment (exams and quizzes)	50% of the marking period grade
Laboratory/Projects	30% of the marking period grade
Homework/Classwork	20% of the marking period grade

Each marking period is worth 20% of a student's overall grade. The final is worth 20% of a student's overall average:

Quarter 1	20%
Quarter 2	20%
Quarter 3	20%
Quarter 4	20%
Final	20%

Required Summer Reading/Assignments:

There is no summer assignment.