CHEMISTRY/CHEMISTRY HONORS

CREDIT HOURS: 1.0  
COURSE LENGTH: 2 Semesters

COURSE DESCRIPTION

Classification, structure, and changes of matter, atomic theory, and the periodic table are addressed in this course. Students will also learn about bonding, chemical formulas, chemical reactions, and balanced equations. From stoichiometry to acids and bases to the dynamics of energy, this course includes everything necessary to study the composition, properties, and changes associated with matter and their applications.

The honors level course requires students to utilize higher order thinking skills such as analysis and synthesis, while completing more rigorous assignments. In addition, more emphasis is placed on research mastery and project based learning.

COURSE PREREQUISITES

Biology and Algebra 1

REQUIRED TEXTBOOK (S) and/or MATERIALS

Chemistry Lab Kit (Miami Chemistry V4)

TOPIC OUTLINE

Semester I:

1. What is Chemistry?
2. Experiments and Properties
3. Chemical Building Blocks
4. Inside the Atom
5. History of an Atom
6. The Periodic Table
7. Periodic Trends
8. Measurement
9. Significant Figures
10. Density
11. Good Science and Bad Science
12. Types of Bonding
13. Ions and Ionic Bonds
14. Covalent Bonding
15. Electron Configuration
16. Molecular Geometry
17. Polar and Non-Polar Molecules
18. Intermolecular Forces
19. Reactions and Balancing Equations
20. Green Chemistry
21. Classifying Chemical Reactions
22. Writing and Balancing Equations
23. Energy in Reactions
24. Calorimetry
25. The Mole
26. Stoichiometry
27. Limiting Reactants
28. Limiting Reactants Experiment
29. Midterm Review

Semester II:

1. Nuclear Reactions
2. Half-Life Calculations
3. Nuclear Science Applications
4. Nuclear Power
5. Nuclear Waste
6. Kinetic Molecular Theory
7. Measuring Gases
8. Boyle’s and Charles’ Laws
9. Ideal Gas Law
10. Acid Base Characteristics
11. Indicators
12. Chemical Equilibrium
13. Le Chatelier’s Principle
14. pH Calculations
15. Buffers
16. Titrations
17. Solutions 1
18. Solutions 2
19. Aqueous Reactions and Precipitates
20. Solutions Lab and Report
21. Reaction Rates
22. Electrochemical Cells
23. Electrolysis
24. Introduction to Carbon Chemistry
25. Aromatic Molecules
26. Application of Carbon Chemistry
27. Forensic Chemistry
28. Using Forensic Chemistry
29. Semester Review