CHEM A080N: CHEMISTRY STUDY SKILLS FOR GENERAL CHEMISTRY A

Item	Value
Curriculum Committee Approval Date	03/23/2022
Top Code	493062 - Secondary Education (Grades 9-12) and G.E.D.
Units	0 Total Units
Hours	18 Total Hours (Lecture Hours 18)
Total Outside of Class Hours	0
Course Credit Status	Noncredit (N)
Material Fee	No
Basic Skills	Basic Skills (B)
Repeatable	Yes; Repeat Limit 99
Grading Policy	P/NP/SP Non-Credit (D)

Course Description

This is a course designed to provide additional practice of the concepts learned in CHEM A180 - General Chemistry A. Students will develop skills necessary to successfully demonstrate competency in CHEM A180. This course is expected to increase retention and student success in CHEM A180 and is part of the Chemistry Skills Certificate of Competency. Noncredit. NOT DEGREE APPLICABLE. COREQUISITE: CHEM A180. Not Transferable.

Course Level Student Learning Outcome(s)

1. Use unit equations and algebraic methods to solve computational problems in the areas of unit conversion, stoichiometry, gas laws, thermochemistry, and solution concentrations.
2. Apply the principles of electron configurations, Lewis structural theory, VSEPR theory, molecular orbital theory, and valence bond theory to predict the structure, bonding, three-dimensional shape, and molecular polarity of simple inorganic and organic species from the chemical formula.
3. Use the atomic theory and kinetic molecular theory to explain the gas laws and the properties of ideal and non-ideal gases.
4. Write and balance molecular, total ionic and net ionic equations for chemical reactions, including predicting the products of ionic reactions and writing the correct ionic formulas.

Course Objectives

- 1. Describe the meaning and common usage of terms important in general chemistry.
- 2. Use systematic chemical nomenclature principles to name compounds; or given the name, write the formula.
- 3. Predict and write balanced chemical equations and properly interpret chemical equations.
- 4. Draw Lewis structures of molecules and ions. Draw sketches of orbital representations.
- 5. Analyze and solve chemistry problems in an organized and logical manner.

Lecture Content

1. Measurements, rounding calculated answers, precision, and accuracy2. The mole and molar mass3. Interpretation of a chemical formula and finding the empirical formula4. Oxidation numbers5. Nnomenclature of compounds and ions6. Stoichiometry7. Kinetic Molecular Theory8. Gas law calculations 9. Oxidation and reduction10. Half equations, redox equations, and balancing11. Molarity12. Titration calculations13. Precipitation reactions14. Acid base reactions15. Thermochemistry16. Quantum theory and photoelectric effect calculations. 17. Bohr model 18. Quantum numbers, electronic configuration, ionization energies, paramagnetism and diamagnetism.19. Periodic trends 20. Lewis structures and molecular geometry as predicted by VSEPR Theory.21. Resonance hybrids.22. Bond energies, calculating the change in enthalpy from bond energies23. Valence bond theory

Method(s) of Instruction

- Enhanced NC Lect (NC1)
- Online Enhanced NC Lect (NC5)
- Live Online Enhanced NC Lect (NC9)

Instructional Techniques

Lecture, demonstration and discussion Cooperative learning using group work and activities. Guided practice and study using worksheets.

Reading Assignments

Each topic discussed will include a written description which can be referred to while completing worksheets.

Writing Assignments

Worksheet completion will include the need to write down setups and explanations.

Out-of-class Assignments

Completion of worksheets introduced in class

Demonstration of Critical Thinking

Graded worksheets will demonstrate abilities to explain chemical concepts, principles and problem solving skills.

Required Writing, Problem Solving, Skills Demonstration

Weekly quizzes will include some questions requiring the writing of sentence explanations and/or descriptions. Students will be expected to analyze questions and create answers to them. Some answers will be in the language of mathematics and other will be in English. Some questions will require the use of principles to synthesize an answer which was not taught.

Eligible Disciplines

Chemistry: Masters degree in chemistry OR bachelors degree in chemistry or biochemistry AND masters degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent. Masters degree required.

Other Resources

1. All printed material will be provided as a workbook produced by the Chemistry Department.