

GENERAL INFORMATION			
Name: Tchao Podona	Phone #: 305-237-8483		
Course Prefix/Number: CHM 1020	Course Title: General Education Chemistry		
Number of Credits: 3 Credits			
Degree Type	<input type="checkbox"/> B.A. <input type="checkbox"/> B.S. <input type="checkbox"/> B.A.S <input checked="" type="checkbox"/> A.A. <input type="checkbox"/> A.S. <input type="checkbox"/> A.A.S. <input type="checkbox"/> C.C.C. <input type="checkbox"/> A.T.C. <input type="checkbox"/> V.C.C		
Date Submitted/Revised: 11/10/07	Effective Year/Term: 2008-1		
<input type="checkbox"/> New Course Competency <input checked="" type="checkbox"/> Revised Course Competency			
Course to be designated as a General Education course (part of the 36 hours of A.A. Gen. Ed. coursework): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
The above course links to the following Learning Outcomes: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Communication <input checked="" type="checkbox"/> Numbers / Data <input checked="" type="checkbox"/> Critical thinking <input type="checkbox"/> Information Literacy <input type="checkbox"/> Cultural / Global Perspective </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Social Responsibility <input type="checkbox"/> Ethical Issues <input type="checkbox"/> Computer / Technology Usage <input type="checkbox"/> Aesthetic / Creative Activities <input checked="" type="checkbox"/> Environmental Responsibility </td> </tr> </table>		<input type="checkbox"/> Communication <input checked="" type="checkbox"/> Numbers / Data <input checked="" type="checkbox"/> Critical thinking <input type="checkbox"/> Information Literacy <input type="checkbox"/> Cultural / Global Perspective	<input type="checkbox"/> Social Responsibility <input type="checkbox"/> Ethical Issues <input type="checkbox"/> Computer / Technology Usage <input type="checkbox"/> Aesthetic / Creative Activities <input checked="" type="checkbox"/> Environmental Responsibility
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Course Description: This course provides the non-science major with an introductory study of the substances central to our daily lives. The students will learn the basic chemistry of nutrition, medicines, cosmetics, household cleaners and the environment.			
Prerequisite(s): None	Co-requisite(s): None		

Course Competencies:

Competency 1: The student will demonstrate knowledge of the basic methodologies of science by:

1. Describing the steps involved in the scientific method.

Competency 2: The student will demonstrate knowledge of the basic units, calculations, conversions, and measurements that are the very foundation of chemistry by:

1. Demonstrating how very large or very small numbers are expressed in scientific or exponential notation.
2. Converting ordinary numbers into scientific or exponential notation and vice-versa.
3. Converting measurements from one metric unit to another using conversion factors.
4. Defining density and performing basic density calculations.

Revision Date: _____

Approved By Academic Dean Date: _____

Reviewed By Director of Academic Programs Date: _____

Competency 3: The student will demonstrate knowledge of matter's classification, properties, and changes by:

1. Comparing and contrasting several properties of the different states of matter.
2. Explaining how the interconversion between states of matter can occur as well as describing and naming these processes.
3. Identifying the symbols used to represent the most common elements.
4. Distinguishing matter as either a pure substance or mixture.
5. Distinguishing pure substances as elements or compounds.
6. Distinguishing mixtures as either homogeneous or heterogeneous.
7. Distinguishing between physical and chemical properties and physical and chemical changes of matter.

Competency 4: The student will demonstrate knowledge of the basic building blocks of matter by:

1. Identifying several properties and general arrangement of the three major subatomic particles (i.e., electrons, protons, and neutrons) of the atom.
2. Defining isotopes and describing how various isotopes of a single element differ.
3. Identifying the number of protons, neutrons, electrons, mass number, and atomic number that an atom has, given its isotopic symbol.

Competency 5: The student will demonstrate an ability to understand several of the intricacies of the periodic table by:

1. Distinguishing between periods and groups on the periodic table.
2. Showing the relationship between position on the periodic table and atomic number.
3. Distinguishing elements by using the structure of the periodic table and the periodic law (e.g., metal, non-metal, metalloid, noble gas, representative element, transition element, alkali metal, alkaline earth metal, and halogen).
4. Describing the relationship that exists between the number of valence electrons an element has and its group number.
5. Describing the relationship between an element's group number and the ion that it commonly forms.

Revision Date: _____

Approved By Academic Dean Date: _____

Reviewed By Director of Academic Programs Date: _____

Competency 6: The student will demonstrate knowledge of electronic structures by:

1. Demonstrating the relationship that exists between wavelength, frequency, and energy of electromagnetic radiation.
2. Stating the number of electrons that can be accommodated in the main energy levels of an atom.
3. Using the Bohr Model to determine the electronic configuration for the first 20 elements in the periodic table.
4. Stating the number of valence electrons in an atom.

Competency 7: The student will demonstrate knowledge of chemical bonding and intermolecular forces by:

1. Predicting the bond that two atoms will form depending on where they are located on the periodic table.
2. Describing the formation of ions from their parent atoms.
3. Describing how and why ionic and covalent bonds form.
4. Writing the Lewis electron dot structure of elements, ions, ionic compounds and covalent compounds.
5. Comparing and contrasting ionic and covalent bonding.
6. Defining electronegativity.
7. Describing the difference between polar and non-polar covalent bonds.
8. Predicting bond polarity by calculating the difference in electronegativity between two elements involved in a chemical bond.
9. Describing how forces of attraction, such as hydrogen bonding, operate between molecules.

Competency 8: The student will demonstrate knowledge of the composition, nomenclature, and reactivity of several chemical substances by:

1. Identifying what atoms are present in a compound and in what ratio.
2. Naming and writing the formula of binary ionic and covalent compounds.
3. Naming and writing the formula of common polyatomic ions.
4. Naming and writing the formula of ternary ionic compounds.
5. Defining a mole.
6. Computing the molar mass of a substance from the sum of the atomic masses of the elements from which it is made.
7. Manipulating conversions between mass and moles.
8. Producing balanced chemical equations.

Revision Date: _____

Approved By Academic Dean Date: _____

Reviewed By Director of Academic Programs Date: _____

9. Identifying the significance of the coefficients in a balanced chemical equation.
10. Solving basic stoichiometry problems.
11. Applying the Law of Conservation of Mass.
12. Comparing and contrasting endothermic and exothermic reactions.

Competency 9: The student will demonstrate knowledge of the properties and characteristics of water and aqueous solutions by:

1. Showing the distribution of water resources on the surface of the earth and how water is recycled in the hydrologic cycle.
2. Distinguishing between the components in a solution.
3. Distinguishing between the different types of solution (i.e., saturated, unsaturated, and supersaturated).
4. Showing how polarity, temperature, and pressure affect solubility.
5. Performing mass percent and molarity calculations.
6. Identifying several unique properties of water.
7. Comparing and contrasting several properties of solution (e.g., freezing point depression, boiling point elevation, osmosis).
8. Explaining water hardness and its effects.
9. Explaining steps to treat, purify, and disinfect water.

Competency 10: The student will demonstrate knowledge of acid-base chemistry by:

1. Predicting the products and producing balanced equations for ionization reactions of acids, bases, and salts.
2. Differentiating between different types of electrolytes (e.g., strong, weak, and nonelectrolytes).
3. Comparing and contrasting properties of acids and bases.
4. Predicting the products and producing balanced equations for neutralization reactions.
5. Describing the interrelationship between pH, pOH, $[H^+]$, and $[OH^-]$ and the conversion from one to another.
6. Comparing and contrasting properties of buffered and unbuffered solutions.

Revision Date: _____

Approved By Academic Dean Date: _____

Reviewed By Director of Academic Programs Date: _____

Competency 11: The student will demonstrate knowledge of the nature and nomenclature of organic compounds by:

1. Providing dash structural formulas and condensed structural formulas for various classes of organic compounds.
2. Identifying and producing formulas for structural isomers.
3. Distinguishing between functional groups (alkanes, alkenes, alkynes, arenes, halides, alcohols, phenols, ethers, amines, aldehydes, ketones, carboxylic acids, esters, and amides).
4. Applying the International System of Pure and Applied Chemistry (IUPAC) nomenclature to simple organic compounds.

Competency 12: The student will demonstrate knowledge of the nature of biomolecules by:

1. Comparing and contrasting the properties, sources, caloric value, and dietary and nutritional importance of carbohydrates, lipids, and proteins.
2. Comparing and contrasting the composition and properties of nucleic acids.

Competency 13: The student will demonstrate knowledge of nuclear chemistry by:

1. Comparing and contrasting the relative harmfulness, shielding requirements, and penetrating ability of several types of nuclear radiation emitted from atomic nuclei.
2. Producing balanced nuclear reactions.
3. Identifying the risks, benefits, disposal, and uses of radioisotopes.
4. Solving half-life problems.
5. Comparing and contrasting nuclear fission and fusion.

Revision Date: _____

Approved By Academic Dean Date: _____

Reviewed By Director of Academic Programs Date: _____

Competency 14: The student will demonstrate knowledge of the chemical basis to environmental issues by:

Outlining the effects to the environment of each of the following:

- a) Acid Precipitation.
- b) The Greenhouse Effect.
- c) Depletion of the Ozone Layer.
- d) The earth's atmosphere and its role in regulating the amount of electromagnetic radiation which hits the earth's surface.
- e) The formation, composition, uses, and environmental impact of various fossil fuels.

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