MASTER COURSE OUTLINE
Prepared By: Date: Sep 2017

COURSE TITLE
General Chem w/Lab I

GENERAL COURSE INFORMATION
Dept.: CHEM& Course Num: 161 (Formerly:)
CIP Code: 40.0501 Intent Code: 11 Program Code: N/A
Credits: 5
Total Contact Hrs Per Qtr.: 71.5
Lecture Hrs: 38.5 Lab Hrs: 33 Other Hrs: 0
Distribution Designation: Lab Science LS

COURSE DESCRIPTION (as it will appear in the catalog)
The first in a three-quarter series examining the principles of General Chemistry with the primary emphasis on inorganic chemistry. This series is designed for physical science majors, pre-medical, pre-veterinary and pre-pharmacy students, and for students who are required to take one or more quarters of majors-level chemistry. Topics include: matter and measurements, atoms, molecules and ions, chemical formulas, chemical reactions and equations, electronic structure of atoms and periodic properties of elements.

PREREQUISITES
Placement in MATH& 141 or completion of MATH 099. A passing grade in high school chemistry or completion of CHEM& 121 recommended.

TEXTBOOK GUIDELINES
A current General Chemistry text sufficient to cover the full year. A typical example is Ebbing and Gammon, *General Chemistry*. A current General Chemistry laboratory manual. A typical example is Slowinski and Wolsey, *Chemical Principles in the Laboratory*. Both texts need departmental approval.

COURSE LEARNING OUTCOMES
Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills:
1. Translate between inorganic chemical formulas and nomenclature.
2. Comfortably use the metric system.
3. Use the periodic table as an information tool.
4. Convert between mass and moles for a variety of elements and compounds.
5. Relate mass and moles using a balanced chemical equation (stoichiometry).
6. Solve thermochemical equations.
7. Apply the concepts of enthalpy and entropy to chemical reactions.
8. Describe the subatomic structure of matter.
9. Describe the quantum mechanical theory.
10. Describe the particle/wave duality of matter and energy.
11. Perform calculations based on wavelength and frequency of electromagnetic radiation.

12. Determine electron configuration of a given atom or ion.
13. Use Lewis Structures to describe the formation of ionic and covalent bonds.
14. Predict polarity and bond order of covalent bonds between different atoms.

INSTITUTIONAL OUTCOMES

IO2 Quantitative Reasoning: Students will be able to reason mathematically.

COURSE CONTENT OUTLINE

Introduction to Chemistry
- Physical measurements

Atomic theory and structure
- Formulas and names of chemical substances
- Reading and writing chemical equations

The mole concept
- Determination of chemical formulas from percent composition
- Stoichiometry

Behavior of ions in aqueous solutions
- Solution concentrations
- Classes of reactions
- Quantitative analysis

Heats of reaction
- Enthalpy and entropy
- Applying concepts of thermochemistry to chemical equations

The wave nature of light
- The Bohr Theory and photons
- Quantum mechanics

Electronic structure of atoms
- Periodicity of the elements

Ionic and covalent chemical bonding
- Electron configuration of ions
- Polarity of covalent bonds
- Bond length, order, and energy

DEPARTMENTAL GUIDELINES *(optional)*

Evaluation will be accomplished by a combination of graded homework, examination, quizzes and laboratory performance and write up.

The final grade will be based on a percentage of the total points possible:
A typical breakdown of the points is: Three unit exams comprise approximately 40% of the total score, the final exam approximately 20%, laboratories approximately 24%, quizzes and homework provide the balance of the points.

PO5 should be assessed: Students will be able to solve problems by gathering, interpreting, combining and/or applying information from multiple sources.

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DIVISION CHAIR APPROVAL **DATE**