

Course Title & Number: Concepts of Chemistry CHE *H111

Competency Area: **SCIENTIFIC KNOWLEDGE / UNDERSTANDING** (Goal: Students will gain a broad base of scientific knowledge and methodologies in the natural sciences. This will enable them to develop scientific literacy, the knowledge and understanding of scientific concepts and processes essential for personal decision making and understanding scientific issues.)

Faculty submitting the Learning Outcomes: Alex J. Zozulin

Date: February 25, 2013

[Instructions: Please match the Learning Outcomes in the left hand column to those of the course you are submitting for Gen Ed approval. List the corresponding course outcomes in the right hand column to indicate a match.]

BOR TAP's Learning Outcomes	Corresponding Outcomes for Course Named Above
1. Communicate using appropriate scientific terminology.	Describe various theories (such as atomic theory, kinetic molecular theory and various bonding theories) using appropriate terminology as it applies to that theory Produce a written document containing experimental data, the results, and the significance of the results using appropriate terminology Identify chemical substances by applying their correct chemical names Categorize chemical reactions by name and provide names of reactants and products Use proper terminology to describe the Periodic Table and trends in chemical and physical properties of the elements Describe the characteristics of the solid, liquid and gas phase and the energy requirements to cause phase changes using correct terminology Describe the molecular geometry and polarity of molecular substances using the appropriate terminology
2. Use representations and models to communicate scientific knowledge and solve scientific problems.	Apply the principles of dimensional analysis to problem solving Use various bonding theories to describe the bonding in molecules and predict physical properties of the substance Apply mathematical modeling to the gas phase to represent the relationship between variables and to solve problems involving those variables Describe the factors that determine heat transfer and use the relationship between variables to determine the energy change in a system Use the quantitative relationships between chemical substances in a

	chemical reaction (stoichiometry) to solve problems
3. Plan and implement data collection strategies appropriate to a particular scientific question.	Analyze an experimental approach to solve a scientific question Collect laboratory data based on this approach such that the results will provide a solution to the scientific question
4. Articulate the reasons that scientific explanations and theories are refined or replaced.	Explain the role of experimentation in the development of theories Explain the significance and limitations of various bonding theories Explain the significance and limitations of early atomic theories
5. Evaluate the quality of scientific information on the basis of its source and the methods used to generate it.	Apply chemical principles to differentiate between reasonable and unreasonable scientific information Use chemical principles to evaluate the methods to obtain scientific information
	<i>Additional Outcomes</i>