

# Bemidji State University

## CHEM 1111: General Chemistry I

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

A survey of chemistry covering basic concepts including inorganic, organic, and biochemistry. The laboratory component introduces techniques, methods, and instrumentation. Liberal Education Goal Area 3 (LC).

**B. COURSE EFFECTIVE DATES:** 09/03/2002 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Matter, energy and measurement
2. Atoms
3. Chemical bonds
4. Chemical reactions
5. Gases, liquids and solids
6. Solutions and colloids
7. Reaction rates and equilibrium
8. Acids and bases
9. Nuclear chemistry

### D. LEARNING OUTCOMES (General)

1. review math and learn to do calculations while working everyday examples using metric units.
2. understand the differences between a chemical change and physical change.
3. understand the relationship between electron arrangement, group number, and periodic law.
4. understand the atomic relationship of isotopes and ions to the atomic mass of an element on the periodic table.
5. learn the relationship between group numbers, valence electrons, and the formation of ionic and covalent compounds.
6. write ionic formulas and names of compounds.
7. use VESPR theory to determine the shape, bond angles, and polarity of a molecule.
8. use the appropriate mole factors and molar masses to calculate the mass of a reactant, product/percent yield.
9. understand and use the ideal gas law and common gas law to calculate an unknown pressure, volume, temperature, and/or moles a gas.
10. calculate the percent concentrations and molarity of a solution.
11. understand Le Chatelier's principle.
12. understand properties of acids and be able to do pH calculations.

## **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

## **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

## **G. SPECIAL INFORMATION**

None noted