

Des Moines Area Community College

Academic Achievement Center

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Course: **Preadmission Chemistry II** (Second of two parts)

CRN: **12361**

Prerequisites: None

Textbook: Essential Concepts of Chemistry

Authors: Sherman and Sherman

Publisher: Houghton Mifflin Company, ISBN 0-395-92127-9

Course Description: This is a noncredit, independent study course. It is designed to prepare students who lack a high school chemistry course or are under prepared for college level course(s) in chemistry.

In Chemistry II the topics covered include: chemical formulas, chemical equations, stoichiometry, solutions, acids, bases, salts and gases.

The student will be tested at the end of each chapter.

Course Competencies: The student successfully completing this course has mastered the following competencies:

- 9 Understand how to calculate mass from chemical formula and how to convert mass to moles or number of atoms.**

- 9.1 Calculate the number of moles in a sample when you are given the mass.
- 9.2 Calculate the mass, in grams, when you are given the number of moles.
- 9.3 Calculate the number of atoms in a sample when you are given the mass.
- 9.4 Calculate the formula of a compound when you are given its percentage composition.

10 Understand chemical equations.

- 10.1 Write balanced chemical equations.
- 10.2 Predict the products for various types of reactions.
- 10.3 Explain the different types of chemical reactions.
- 10.4 Distinguish between oxidation and reduction in a reaction.

11 Understand the quantities in reactions (stoichiometry).

- 11.1 Calculate the quantities of reactants needed or products yielded in a chemical equation.

15 Understand the chemistry of solutions.

- 15.1 Define the terms solution, solute and solvent.
- 15.2 Determine whether a solution is unsaturated, saturated or supersaturated.
- 15.3 Calculate concentrations of solutions.
- 15.4 Calculate molarity of solutions.
- 15.5 Calculate molality of solutions.
- 15.6 Distinguish between diffusion and osmosis and make predictions based on experimental set-ups.

16 Understand the properties of acids, bases and salts.

- 16.1 Distinguish between acids and bases and provide examples.
- 16.2 Define pH and explain the values on the pH scale.

16.3 Calculate the pH of a solution when given its H⁺ or OH⁻ concentration.

16.4 Write equations for the preparation of salts.

13 Understand the properties of gases.

13.1 State the kinetic theory of gases.

13.2 Apply Boyle's Law, Charles' Law and the Combined Gas Law to relations between the pressure, temperature and volume of any amount of an ideal gas.

13.3 Convert from Celsius degrees to Kelvins and vice versa.

13.4 Use the Ideal Gas Law to calculate the pressure, volume, temperature, or number of moles of a gas when you are provided with the other three.

13.5 Use the Ideal Gas Law to calculate the molecular mass of a gas.