

BUTTE COLLEGE

COURSE OUTLINE

I. CATALOG DESCRIPTION

CHEM 110 - Introductory Chemistry

4 Unit(s)

Prerequisite(s): NONE

Recommended Prep: Reading Level IV; English Level IV; Math Level IV

Transfer Status: NT

51 hours Lecture

51 hours Lab

This course is for the student who lacks the necessary background to enroll directly in CHEM 51 or CHEM 1. The assumption is made that this is the student's first exposure to chemistry. With that in mind, both the philosophy and practice of laboratory chemistry are pursued. The approach to many topics is quantitative and the topics chosen are those that are bothersome to students in more advanced courses. The goal is to prepare students for CHEM 51 or CHEM 1 and further study in chemistry.

II. OBJECTIVES

Upon successful completion of this course, the student will be able to:

- A. explain the concepts of scientific thought and the scientific method.
- B. demonstrate the predictive nature of science.
- C. describe with basic understanding, chemical principles identified in the unit titles.
- D. demonstrate appropriate calculation and problem-solving skills.
- E. demonstrate basic laboratory skills, including lab safety.

III. COURSE CONTENT

A. Unit Titles/Suggested Time Schedule

Lecture	
<u>Topics</u>	<u>Hours</u>
1. Measurements and Calculations	2.00
2. Matter	2.00
3. Elements, Atoms and Ions	3.00
4. Nomenclature	3.00
5. Chemical Reactions	4.00
6. Stoichiometry	8.00
7. Energy	2.00
8. Modern Atomic Theory	4.00
9. Bonding and Lewis Structures	4.00
10. Gases	4.00
11. Liquids and Solids	3.00
12. Solutions	5.00
13. Acids and Bases	4.00
14. Kinetics and Equilibrium	3.00
Total Hours	51.00

Lab

<u>Topics</u>	<u>Hours</u>
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1.	Lab Procedure and Safety	6.00
2.	Measurements	9.00
3.	Matter and Energy	6.00
4.	Chemical Equations and Stoichiometry	9.00
5.	Gases	3.00
6.	Electronic Structure	3.00
7.	Bonding and Lewis Structures	3.00
8.	Solutions and Solution Stoichiometry	6.00
9.	Kinetics and Chemical Equilibrium	3.00
10.	Acid-Base Chemistry	3.00
	Total Hours	51.00

IV. METHODS OF INSTRUCTION

- A. Lecture
- B. Instructor Demonstrations
- C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- D. Discussion
- E. Laboratory Experiments

V. METHODS OF EVALUATION

- A. Exams/Tests
- B. Quizzes
- C. Homework
- D. Lab Projects
- E. Final Examination

VI. EXAMPLES OF ASSIGNMENTS

- A. Reading Assignments
 - 1. Read the section on nomenclature in the text and be prepared to name various types of chemical compounds in class.
 - 2. Read the sections in the text on intermolecular bonding and be prepared to discuss boiling points, vapor pressure and surface tension in class.
- B. Writing Assignments
 - 1. Write a paragraph describing the differences between ionic and covalent substances and be prepared to explain the differences between ionic and covalent substances, with examples, on an exam.
 - 2. Write a paragraph giving the instructions to mass 5 grams of sugar to 0.0001g. Be prepared to demonstrate this technique in lab.
- C. Out-of-Class Assignments
 - 1. After reviewing the section on dimensional analysis in the text and notes, complete the assigned end of chapter problems or homework sheet to be turned in, in class.
 - 2. After studying the section on phase changes and energy, be prepared to draw a heating/cooling curve for water beginning at -10°C and ending at 110°C in class.

VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

- A. Tro, N.J. Introductory Chemistry. 5th Edition. Pearson, 2015.
- B. Department of Physical Sciences; Chemistry. Chem 110 Lab Exercises. 2014 Edition. Butte

College, 2014.

Created/Revised by: Penny Lillie

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