

**SEWARD COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS**

I. TITLE OF COURSE: CH1505 - College Chemistry I

**II. COURSE DESCRIPTION: 5 credit hours
3 credit hours of lecture and 2 credit hours of lab per week.**

This is the first part of a two-semester chemistry program designed to provide the foundation for more advanced work. This course includes atomic structure, calculations with formulas, total ionic and net ionic equations, atomic and molecular structure, stoichiometry calculations, concentration calculations, thermochemistry, valence shell hybridization, volumetric solution calculations, oxidation-reduction reactions, gaseous state calculations, colloids, basic chemical equilibrium, and acid-base chemistry. For each unit of credit, a minimum of three hours per week with one of the hours for class and two hours for studying/preparation outside of class is expected.

EduKan course number: CH177

Pre-requisite:

Skill level of English Comp I and Intermediate Algebra or higher.

III. PROGRAM AND/OR DEPARTMENT MISSION STATEMENT:

The Science Program at Seward County Community College provides opportunities to improve and enhance each student's understanding and comprehension of the natural world through a variety of courses and experience to develop a scientifically literate citizen.

IV. TEXTBOOK AND MATERIALS:

1. Burdge, Julia, Chemistry: Atoms First, 4th Ed., New York, NY 10020:McGraw Hill
2. Anthony, S., Braun, K.L., and Mernitz, H., ChemConnections: Activity Workbook, New York, NY: W.W. Norton
3. Internet and SCCC portal access
4. Bryan, William, SCCC College Chemistry Lab Manual.

V. SCCC OUTCOMES:

- 1: Read with comprehension, be critical of what they read, and apply knowledge gained to real life
- 2: Communicate ideas clearly and proficiently in writing, appropriately adjusting content and arrangement for varying audiences, purposes, and situations.
- 3: Communicate their ideas clearly and proficiently in speaking, appropriately adjusting content and arrangement for varying audiences, purposes, and situations.
- 4: Demonstrate mathematical skills using a variety of techniques and technologies.
- 5: Demonstrate the ability to think critically by gathering facts, generating insights, analyzing data, and evaluating information

7: Understand each other, moving beyond simple acceptance to embracing and celebrating the rich dimensions of diversity by working as a team to learn, engaging with community, exhibiting cultural awareness, and creating equity.

VI. COURSE OUTCOMES:

1. Grasp the importance of Chemistry as it applies to everyday events.
2. Learn the kinds of problems that confront chemists and the various methods used to solve particular problems.
3. Expand basic knowledge of chemical laws and theories.
4. Perform chemical calculations.
5. Improve laboratory techniques while maintaining accepted safe laboratory procedures.
6. Analyze chemical reactions.
7. Enlarge chemical vocabulary.
8. Examine a variety of applications of chemistry in the fields of agriculture, pharmacy, ecology, etc. in the US and around the world. Students will then be assessed through their contributions of viewpoints and observations to class discussion on the topics.

Class: Students taking the general chemistry course will:

9. Be able to apply the scientific method to problems both in and out of the classroom
 10. Explain the reasoning and analyze the experiments that led to the adoption of the modern atomic theory.
 11. Be able to perform basic unit conversions.
 12. Relate atomic mass to composition in terms of the composition of subatomic particles.
 13. Draw Lewis dot structures for atoms, simple ionic and molecular compounds.
 14. Be able to determine empirical and molecular formula from appropriate data.
 15. Recognize varying types of reactions and write a balanced chemical equation for the reaction.
 16. Perform stoichiometric calculations.
 17. Determine oxidation numbers
 18. Analyze chemical reactions and predict possible products between two or more reactants.
 19. Name chemical compounds and ions
 20. Be able to recognize the general classification of a named ionic, hydrate, or acid molecule.
 21. Apply the gas laws to general problems.
 22. Have an understanding of the heat exchanged in a reaction.
 23. Be able to distinguish between ionic and covalent bonding
 24. Have a knowledge of valence shell electrons.
 25. Have a working knowledge of periodicity.
 26. Have an understanding of chemical states and transitions between them.
 27. Have a basic understanding of acids and bases.
 28. Have an appreciation for the effect chemistry has on societies around the world.
- Laboratory: Upon successful completion of this course the student will be able to:
29. Gather and record qualitative and quantitative data accurately.
 30. Handle and evaluate data in logical, productive, and meaningful ways.

VII. COURSE OUTLINE:

1. Formulate his/her own concept of chemistry
2. Have a basic understanding of the law of conservation of mass, physical states of matter, physical measurements and dimensional analysis.
3. Learn the parts of the periodic table and be able to make general conclusions on electronegativity, ionization energy, and atomic size of an element.
4. Examine the steps scientists use to solve problems.
5. Examine the history of atomic theory, formulas and names, chemical reactions including equation writing, ions and the types of chemical reactions.
6. Distinguish between mass and moles of substances, determine a chemical formula, and calculate the empirical formula and molecular formulas from percentage composition of molecular mass.
7. Know the gas laws, and the kinetic-molecular theory of gases.
8. Have an understanding of thermochemistry, including enthalpy, entropy, and Hess's Law.
9. Learn about quantum theory
10. Write and understand electron and orbital configurations, and relate the electronic structure of an atom to the periodic table.
11. Distinguish between ionic, covalent, coordinate covalent, polar and non-polar bonds.
12. Identify the difference between gases, liquids, and solids
13. Distinguish between different types of solutions
14. Understand colligative properties, colloid formation and the laws of solubility.

VIII. INSTRUCTIONAL METHODS:

1. Lecture
2. Discussion
3. Laboratory experiments and exercises
4. Problem solving assignments
5. Film and video cassettes
6. Overhead projections
7. Demonstrations related to concepts
8. Computer Programs
9. Internet

IX. INSTRUCTIONAL AND RESOURCE MATERIALS:

1. Chemicals
2. Laboratory equipment
3. Overhead projections
4. Audio and video cassettes
5. Films
6. Available instrumentation

7. Internet

X. METHODS OF ASSESSMENT:

1. SCCC Outcome #1 will be assessed and measured by comprehension of text reading assignments, a semester research project, participation in class discussion and through Calibrated Peer Review(CPR) assignments.
2. SCCC Outcome #2 will be assessed through the student's written CPR essays and semester research paper.
3. SCCC Outcome #3 will be assessed by the student's expression of ideas through class discussion, PLTL workshops, and oral presentation of a semester research project.
4. SCCC Outcome #4 will be assessed and measured by homework problems, short quizzes, tests, class discussion, and PLTL workshops.
5. SCCC Outcome #5 will be assessed and measured by lab experiments, a semester research paper, the chemical product hunt assessment, PLTL workshops, CPR assignments and writing of a laboratory procedure.
6. SCCC Outcome #7 will be assessed through class discussion, written reports on short research topics throughout the semester and CPR assignments. An example is the use of chemicals in the agriculture industry both in America and in that of developing countries.
7. SCCC Outcome #8 will be assessed through class discussion and written reports on the effect of chemicals on ecological systems and how individuals affect the international, federal, state, and local government controls and regulations.
8. SCCC Outcome #9 will be assessed through class attendance, group participation, and individual ethics used in data collection and research reporting.

XI. ADA STATEMENT:

Under the Americans with Disabilities Act, Seward County Community College will make reasonable accommodations for students with documented disabilities. If you need support or assistance because of a disability, you may be eligible for academic accommodations. Students should identify themselves to the Dean of Students at 620-417-1106 or going to the Student Success Center in the Hobbie Academic building, room 149 A.

XII. CORE OUTCOMES PROJECT:

The learning outcomes and competencies detailed in this course outline or syllabus meet, or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents

KRSN: CHM1010

Syllabus Reviewed: 10/28/2021