

CHEM 0001Y - PROBLEM SOLVING FOR CHEMISTRY 1B

Catalog Description

Prerequisite: Completion of CHEM 1A or 3B with grade of "C" or better

Corequisite: Concurrent enrollment in CHEM 1B

Advisory: Eligibility for ENGL 1A strongly recommended

Hours: 18 lecture

Description: Optional problem solving course to accompany CHEM 1B. Students use critical thinking and problem solving strategies to solve general chemistry problems in topics that include equilibrium, chemical kinetics, acid-base theory, thermodynamics, electro-chemistry, and nuclear chemistry. (CSU)

Course Student Learning Outcomes

- CSLO #1: Solve problems related to thermodynamics, electrochemistry, chemical kinetics, and chemical and physical equilibrium.
- CSLO #2: Apply mathematical problem solving techniques to solve problems in chemistry.
- CSLO #3: Develop rules and strategies for problem solving that are effective in solving new sets of problems.

Effective Term

Fall 2022

Course Type

Credit - Degree-applicable

Contact Hours

18

Outside of Class Hours

36

Total Student Learning Hours

54

Course Objectives

1. Solve problems related to chemical bonding, thermodynamics, electrochemistry, nuclear chemistry, chemical kinetics, acid-base theory, and equilibrium;
2. Identify by using a diagram, a list, an equation, and/or words, the basic chemical concepts and principles affecting a given chemical system;
3. Build a conceptual model of the given chemical system and explain the system using the model in a written or oral form;
4. Apply mathematical problem solving techniques (algebraic equations, unit factor method, etc.) to solve problems in chemistry; and
5. Develop rules and strategies for problem solving that are effective in solving new sets of problems.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Classroom Discussions
 - Example: Students will be evaluated on their participation in classroom discussions using the LMS discussion board to explain one of the problem solutions to their peers. For example "After 55 years, what mass (in grams) remains of a 200.0 g sample of a radioactive isotope with a half-life of 10.0 years?"
- Problem Solving Examinations
 - Example: Students will be evaluated throughout the semester on successful completion of problem solving worksheets. For example, "The rate constant for a given reaction is 2.57/M-s at 700K and is 567/M-s at 900 K. What is the activation energy for this reaction?"

Repeatable

No

Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. In Class or Distance Learning: A classroom lecture covering chemical kinetics is followed by a worksheet that students will complete working in small groups while the instructor roams the room, offering guidance to facilitate learning. In the online modality, this can be accomplished using breakout groups or discussion boards.

Distance Learning

1. After the instructor provides a presentation of nuclear decay, students be asked to complete an assigned worksheet. Using the discussion board, students will explain one of the problem solutions to their peers. For example "After 55 years, what mass (in grams) remains of a 20
2. 0 g sample of a radioactive isotope with a half-life of 1
3. 0 years?"

Typical Out of Class Assignments Reading Assignments

1. Read a section from the textbook. Be prepared to use the content to participate in the classroom and to complete assigned problems from the textbook. For example: Read the section on chemical kinetics from the textbook. Be prepared to use the content to participate in the classroom and to complete assigned problems from the textbook.
2. Read a sample problem from a handout. For example: Read a problem on chemical kinetics from a handout. Be prepared to discuss the solution.

Writing, Problem Solving or Performance

1. Solve problems from a worksheet. For example: Determine the rate order of iodide in the experiment provided rates of reactions. 2. Solve problems from the textbook. For example: After 55 years, what mass (in grams) remains of a 200.0 g sample of a radioactive isotope with a half-life of 10.0 years? 3. Explain how to solve an assigned problem in the course discussion board. For example, explain to your peers how to solve the problem "After 55 years, what mass (in grams) remains of a 200.0 g sample of a radioactive isotope with a half-life of 10.0 years?"

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- Chemistry and Chemical Reactivity
 - Author: Kotz
 - Publisher: Thomson
 - Publication Date: 2011
 - Text Edition: 8th
 - Classic Textbook?:
 - OER Link:
 - OER:
- Preparing for your ACS Examination in General Chemistry
 - Author: Examinations Institute
 - Publisher: American Chemical Society
 - Publication Date: 2019
 - Text Edition: 2nd
 - Classic Textbook?:
 - OER Link:
 - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.