CHEM 3AL Course Outline as of Fall 2020

CATALOG INFORMATION

Dept and Nbr: CHEM 3AL Title: GENERAL CHEMISTRY 1: LAB

Full Title: General Chemistry Part 1: Lab

Last Reviewed: 8/26/2024

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	1.00	17.5	Lecture Scheduled	17.50
Minimum	2.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 35.00 Total Student Learning Hours: 105.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

General principles of chemistry, including atomic theory, bonding, stoichiometry, kinetic molecular theory of gases, properties of mixtures, the periodic table, and thermochemistry. Emphasis will be placed n laboratory experiments that illustrate the fundamental principles and laws of chemical behavior and the properties of matter. Lab portion of the first semester of a one-year program of general chemistry.

Prerequisites/Corequisites:

Course Completion or Current Enrollment in CHEM 3A

Recommended Preparation:

Course Completion of ENGL 1A

Limits on Enrollment:

Schedule of Classes Information:

Description: General principles of chemistry, including atomic theory, bonding, stoichiometry, kinetic molecular theory of gases, properties of mixtures, the periodic table, and thermochemistry. Emphasis will be placed n laboratory experiments that illustrate the fundamental principles and laws of chemical behavior and the properties of matter. Lab portion

of the first semester of a one-year program of general chemistry. (Grade Only)

Prerequisites/Corequisites: Course Completion or Current Enrollment in CHEM 3A

Recommended: Course Completion of ENGL 1A

Limits on Enrollment: Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree: Area Effective: Inactive: CSU GE: Transfer Area Effective: Inactive:

B3 Laboratory Activity Fall 2020

IGETC: Transfer Area Effective: Inactive:

5C Fulfills Lab Requirement Fall 2020

CSU Transfer: Transferable Effective: Fall 2020 Inactive:

UC Transfer: Transferable Effective: Fall 2020 Inactive:

CID:

CID Descriptor: CHEM 110 General Chemistry for Science Majors I, with Lab

SRJC Equivalent Course(s): CHEM1A OR CHEM4A OR CHEM3A AND CHEM3AL

CID Descriptor: CHEM 120S General Chemistry for Science Majors Sequence A

SRJC Equivalent Course(s): CHEM1A AND CHEM1B OR CHEM4A AND CHEM4B OR

CHEM3A AND CHEM3AL AND CHEM3B

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

- 1. Demonstrate proficiency in fundamental chemistry laboratory techniques.
- 2. Carry out experiments safely and carefully in the lab.
- 3. Obtain accurate data and interpret and manipulate the data correctly.
- 4. Relate experimental observation in the lab to theoretical chemical concepts from the lecture.

Objectives:

At the conclusion of this course, the student should be able to:

- 1. Prepare for and conduct experiments, safely and correctly, and clean up and dispose of waste.
- 2. Perform synthesis, characterization, and determination of yield.
- 3. Experimentally verify known physical quantities.
- 4. Identify and perform quantitative analysis on mixtures.
- 5. Measure physical and chemical properties,
- 6. Generate calibration curves and use them with an appropriate level of precision.
- 7. Use scientific writing and format to clearly communicate results of experiments.

Topics and Scope:

I. Atomic Spectroscopy

- II. Molecular Shapes
- III. Synthesis of a Compound
- IV. Behavior of Chemical Substances
- V. Solutions
- VI. Thermochemistry
- VII. Gas Laws
- VIII. Skills
 - A. Fundamental lab skills
- B. Error analysis, safety, use of significant Figures, Use of proper glassware, use of a lab notebook
 - C. Computational skills (including graphing and preparation of calibration curve)
 - D. Instrumentation

All topics are covered in the lecture and lab portions of the course.

Assignment:

Lecture-Related Assignments:

1. Lab reports (approximately 1 per week)

Lab-Related Assignments:

- 1. Lab experiments with data analysis (approximately 1 per week)
- 2. Lab practicals (0-2 per semester)
- 3. Midterm lab exams (0-2 per semester), lab quizzes (0-4 per semester), final lab exam (0-1 per semester)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Lab reports

Writing 25 - 75%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab experiments with data analysis

Problem solving 25 - 75%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Lab practicals

Skill Demonstrations 0 - 25%

Exams: All forms of formal testing, other than skill performance exams.

Midterm lab exams, lab quizzes, final lab exam

Exams 0 - 25%

Other: Includes any assessment tools that do not logically fit into the above categories.

Representative Textbooks and Materials:

Instructor prepared materials

Laboratory Experiments for Chemistry: The Central Science. 13th ed. Brown, Theodore and Nelson, John and Kemp, Kenneth.Pearson. 2015 (classic)

Laboratory Manual for Chemistry: A Molecular Approach. 4th ed. Tro, Nivaldo and Vincent, John and Livingston, Erica. Pearson. 2017