

Lassen Community College Course Outline

CHEM40L – Teaching Laboratory for Survey of Chemistry and Physics

1.0 Units

I. Catalog Description

This is an investigation of the basic principles of physics and chemistry using laboratory instruments and hands-on experiment. The teaching laboratory will cover principles of data taking, data analysis, and technical writing skills for scientific reports. This course is intended for non-science majors and recommended for students in the California State Teacher Preparation Program. This course is web-enhanced.

Prerequisites: None

Co-requisites: CHEM 40

Transferable (with CHEM 40) to CSU/UC

C-ID CHEM 140

51 hours Laboratory, 51 Total Student Learning Hours

Scheduled: Fall, Spring

II. Coding Information

Repeatability: Not Repeatable, Take 1 Time

Grading Option: Graded or Pass/No Pass

Credit Type: Credit – Not Degree Applicable

TOP Code: 190100 Physical Sciences, General

III. Course Objectives

A. Course Student Learning Outcomes

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

1. Investigate physical phenomena using appropriate laboratory equipment and methods, make valid comparisons with theoretical predictions, and communicate those results

B. Course Objectives

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

1. Assemble and perform experiments in basic physics and chemistry
2. Follow instructions in the laboratory manual
3. Measure and record various types of data (ex. Mass, volume, temperature, etc), including estimated uncertainties and appropriate units
4. Analyze the data collected with appropriate calculations
5. Summarize the experimental data and results using effective graphs
6. Critically evaluate the experimental results and procedures using accepted values and other relevant information, and draw conclusion regarding the efficacy of the experimental procedure
7. Present and community the results with appropriate technical writing skills

IV. Course Content

1. Mechanics: pendulum, simple machines, and Archimedes principle
2. Wave and sound: standing wave and the speed of sound
3. Temperature and heat: thermal conductivity, specific heat, states of matter and phase change, and electrical equivalent of heat
4. Electricity and magnetism: electronic circuits, electromagnetism, and electric motors
5. Optics: simple optical instruments, interference and diffraction
6. Atomic and Molecular nature of matter: atomic spectra
7. Chemical reactions
8. Solutions
9. Nuclear physics: half-life of radioactive isotopes

V. Assignments

A. Appropriate Readings

Standard college level texts and articles from the media. Interpreting instructions on the laboratory manual.

B. Writing Assignments

Summarizing experimental objectives, methods, and results in a concise abstract.

Respond to questions that require an essay or a brief answer. Write conclusions and analyses in informal laboratory reports using appropriate technical writing style.

Prepare formal laboratory reports which conform to the style specified in class.

C. Expected Outside Assignments

Problem solving by application of chemical and physical principles. Analyze the experiment and define its goals and correct conclusions.

D. Specific Assignments that Demonstrate Critical Thinking

Compare and contrast the various ways an experiment could be conducted to solve quantitative physics and chemistry problems. Evaluate the significance and relevance of the experimental results.

VI. Methods of Evaluation

1. Mixed format examinations
2. Laboratory technique demonstration
3. Laboratory participation
4. Laboratory reports
5. Laboratory projects

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery Correspondence Delivery

Hybrid Delivery

Online Delivery

1. Demonstration
2. Laboratory manipulation

VIII. Representative Texts and Supplies

- A lab manual will be distributed by the instructor at the beginning of the semester.

IX. Discipline/s Assignment

Chemistry/Physics

X. Course Status

Current Status: Active

Original Approval Date: 12/03/2019

Board Approval Date: 12/017/2019

Chancellor's Office Approval Date: 01/05/2020

Revised By: Yuting Lin

Curriculum/Academic Standards Committee Revision Date: 11/16/2021