

Course Outline

Course Title: General Chemistry I Lab

Common Course Title: CHM1045L

Effective Term: Fall 2017 (Aug 21, 2017)

Credit Hours: 1 Units

Next Review : Aug 1, 2020

Contact Hour Breakdown: *(Per 16 week Term)*

Total: 48

Lecture:

Lab:

Clinic:

Other:

Requirements

Course Description:

Laboratory experiments to accompany Chm1041 or Chm1045.

Course Outline

UNITS

Unit 1 : Laboratory and Safety Rules

General Outcome

1.0 The students shall be able to: (1) conduct a chemistry experiment using proper safety procedures, (2) recognize and respond appropriately to potentially hazardous situations, and (3) recognize the necessity of safe laboratory practices.

Specific Learning Outcomes

1.1 List the safety rules as provided by the instructor.

1.2 Explain the importance of the safety rules to maintain a safe environment for students and faculty.

1.3 Locate and describe the use of safety equipment such as fire extinguishers, fire blanket(s), eye wash station, safety shower, first aid kit, spill clean-up kits, utility shutoff valves, etc.

1.4 Conduct scheduled experiments in accordance with the listed safety rules.

Unit 2 : Reading and Writing in the Chemistry Laboratory

General Outcome

2.0 The student shall be able to clearly communicate in writing information derived from course related readings about the major concepts and themes in the chemical laboratory.

Specific Learning Outcomes

2.1 Demonstrate in writing the ability to analyze, evaluate, compare, and/or extract data relevant to each chemistry experiment.

2.2 Evaluate the validity of information obtained in the laboratory by comparing it to information obtained from electronic, print sources, and/or data bases.

2.3 Demonstrate with the use of diagrams, drawings, outlines, concept maps, and/or other methods the connections among chemical concepts.

2.4 Demonstrate the ability to use the appropriate technology to carry out course requirements.

Unit 3 : Laboratory Calculations

General Outcome

3.0 The students shall be able to apply appropriate mathematical tools to accurately determine calculated results from experimental data.

Specific Learning Outcomes

- 3.1 Set up problems and perform calculations related to the chemical concepts in this laboratory: measurements, physical properties, stoichiometry, gas laws, solution chemistry, colligative properties, acid/base chemistry, electrolytes, oxidation/reduction chemistry, and spectroscopy.
- 3.2 Apply the rules for the use of significant figures and rounding values as they apply to laboratory data.
- 3.3 Demonstrate by proper use the relationship between accuracy and precision.
- 3.4 Average laboratory data correctly
- 3.5 Construct graphs, graph laboratory data, and evaluate the results.
- 3.6 Calculate a percentage yield and percentage error from experimental data.
- 3.7 Evaluate the results of a laboratory calculation in terms of reasonableness.

Unit 4 : Laboratory Skills

General Outcome

- 4.0 The students shall be able to demonstrate laboratory skills in the performance of an experiment

Specific Learning Outcomes

- 4.1 Discuss the theoretical background for each experiment by reading the material provided and answering assigned open-ended questions and/or solving related problems before each lab.
- 4.2 Identify common laboratory glassware, select the appropriate glassware for a procedure, and use it properly and safely to perform a given laboratory task.
- 4.3 Properly assemble laboratory apparatus as required for the experiments performed in this laboratory based on the following topics: measurements, physical properties, stoichiometry, gases, solution chemistry, colligative properties, acid/base chemistry, electrolytes, oxidation/reduction chemistry, and spectroscopy.
- 4.4 Select, dispense, measure, properly use, dilute, and dispose of laboratory chemicals safely and properly.
- 4.5 Operate specific pieces of laboratory equipment including balances, Bunsen burners, burets, pipettes, thermometers, barometers, spectrometers, pH meters, etc.
- 4.6 Perform specific laboratory procedures including determining melting point and boiling point, titrations, filtrations, crystallizations, etc.
- 4.7 Distinguish between objective observation and subjective interpretation.
- 4.8 Perform chemical and physical tests to identify an unknown compound by drawing logical conclusions from observed data.
- 4.9 Complete required laboratory reports including proper representation of data, analysis of data, and discussion of results.