

**LAST REVIEW: 2010-2011**  
*(i.e. 2006-2007)*

**NEXT REVIEW: 2015-2016**  
*(i.e. 2011-2012)*

**STATUS: A**  
*(A, I, D)*

**COURSE TITLE: General Chemistry II Laboratory**

**COMMON COURSE NUMBER: CHM 1046L**

**CREDIT HOURS: 1**

**CONTACT HOUR BREAKDOWN**

*(Per 16 week term)*

**CLOCK HOURS:**  
*(Voc. Course ONLY)*

Lecture:                      Lab: **48**

Clinic:                         Other:

**PREREQUISITE(S): CHM 1041 or CHM 1045, and CHM 1045L**

**COREQUISITE(S): CHM 1046**

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION** *(750 characters, maximum):* **Laboratory experiments to accompany CHM 1046. Special fee charged. Upon successful completion of this course, the students should be able to use appropriate laboratory equipment to safely perform laboratory experiments that relate to the topics covered in CHM 1046, to collect data accurately and to use those data to calculate a reasonable answer or come to a logical conclusion.**

General Education Requirements – Associate of Arts Degree (AA), meets Area(s):                      Area

General Education Requirements – Associate in Science Degree (AS), meets Area(s):                      Area

General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s):                      Area

## **UNIT TITLES**

- 1. Laboratory and Safety Rules**
- 2. Reading and Writing in the Chemistry Laboratory**
- 3. Laboratory Calculations**
- 4. Laboratory Skills**

**EVALUATION:**

In the box to the right of the Methods of Assessment, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 4.0, 4.2 and 5.12) that apply.

|  |  |
|--|--|
| 1. Portfolio                           |  |
| 2. Short essays                        |  |
| 3. Research Papers                     |  |
| 4. Group projects                      | 2.1, 2.2, 2.3, 4.3, 4.4, 4.7, 4.8  |
| 5. Discussions (In class and online)   |  |
| 6. Multiple Choice tests               | 1.1, 1.2, 1.3, 1.4, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8           |
| 7. Presentations                       |  |
| 8. Service Learning Projects           |  |
| 9. Quizzes (pop, announced, etc.)      | 1.1, 1.2, 1.3, 1.4, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8           |
| 10. Take-home tests                    | 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8 |
| 11. Summaries, critiques, and analyses |  |
| 12. Reaction papers                    |  |
| 13. Surveys                            |  |
| 14. Performance                        |  |
| 15. Short answer tests                 | 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8 |
| 16. Classroom debates and colloquia    |  |
| 17. Blogs, wikis, web pages            |  |
| 18. Other (Please explain)             | Submission of written lab reports  |

Common Course Number: CHM 1046L

## **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 Measurable Learning Outcomes:**

**Upon successful completion of this unit, the students shall be able to:**

- 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.**

**Common Course Number: CHM 1046L**

**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 Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 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.**

**Common Course Number: CHM 1046L**

**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 Measurable Learning Outcomes:**

**Upon successful completion of this unit, the students shall be able to:**

- 3.1 Set up problems and perform calculations related to the chemical concepts in this laboratory: Thermodynamics, Chemical Kinetics, Electrochemistry, Acid/base Titration, Oxidation-Reduction Titration, Chemical Equilibrium and LeChatelier's Principle, Qualitative analysis, Synthesis of a Coordination Compound , and An Introduction to Some Organic Compounds.**
- 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.**

Common Course Number: CHM 1046L

**Unit 4: Laboratory Skills**

**General Outcome:**

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

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the students shall be able to:**

- 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: Thermodynamics, Chemical Kinetics, Electrochemistry, Acid/base Titration, Oxidation-Reduction Titration, Chemical Equilibrium and LeChatelier's Principle, Qualitative analysis, Synthesis of a Coordination Compound , and An Introduction to Some Organic Compounds.**
- 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.**