

### CHM1045L General Chemistry and Qualitative Analysis Lab

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**Course Description:** CHM 1045L is the first semester general chemistry laboratory course. Students will learn to introduce the basic laboratory techniques involved in general chemistry and to re-enforce and illustrate several of the important topics in general chemistry (e.g., stoichiometry, gas laws, atomic structure, and quantitative analysis). The enrollment generally consists of pre-medical, pharmacy, medical technology, physical therapy, engineering, and science majors. ( 4 hr. lab )  
 Prerequisite: MAC1105 , CHM1025  
 Corequisite: CHM1045

Course Competency	Learning Outcomes
<p><b>Competency 1:</b> The student will conduct chemistry experiments using proper safety procedures, recognizing and responding appropriately to potentially hazardous situations, and recognize the necessity of safe laboratory practices by:</p>	<p>1. Communication 4. Information Literacy</p>
<ol style="list-style-type: none"> <li>1. Listing the safety rules as provided by the instructor</li> <li>2. Explaining the importance of the safety rules to maintain a safe environment for students and faculty.</li> <li>3. Locating and describing the use of safety equipment such as fire extinguishers, fire blanket(s), eye wash station, safety shower, spill clean-up kits, etc.</li> <li>4. Conducting scheduled experiments in accordance with the safety rules.</li> </ol>	
<p><b>Competency 2:</b> The student will be able to clearly communicate (in writing) the chemical laboratory major concepts and themes from information derived from the laboratory and course related readings by:</p>	<p>1. Communication</p>
<ol style="list-style-type: none"> <li>1. Maintaining a lab notebook by following a specified format.</li> <li>2. Demonstrating in writing the ability to analyze, evaluate, compare, and/or extract data relevant to each chemistry experiment.</li> <li>3. Demonstrating with the use of diagrams, drawings, outlines, concept maps, and/or other methods, the connections among chemical concepts.</li> <li>4. Completing required laboratory reports including proper representation of data, analysis of data, and discussion of results.</li> </ol>	
<p><b>Competency 3:</b> The student will be able to apply appropriate mathematical tools to accurately determine calculated results from experimental data by:</p>	
<ol style="list-style-type: none"> <li>1. Setting up problems and performing calculations related to the following topics: measurements, physical properties, stoichiometry, gas laws, solution chemistry, acid/base chemistry, oxidation/reduction chemistry, atomic structure, and thermochemistry.</li> <li>2. Applying the rules for the use of significant figures and rounding values as they apply to laboratory data.</li> <li>3. Constructing graphs of laboratory data and evaluating the results based on given templates.</li> <li>4. Demonstrating accuracy and precision from experimental data by correctly calculating some or all of the following: average, percent recovery, percent error, average deviation, part per thousand</li> </ol>	

deviation, standard deviation, relative standard deviation, etc.	
<b>Competency 4:</b> The student will be able to demonstrate laboratory skills in the performance of an experiment by:	1. Communication 3. Critical thinking 4. Information Literacy
<ol style="list-style-type: none"> <li>1. Discussing the theoretical background for each experiment by reading the material provided, answering assigned open-ended questions, and/or solving related problems before and after each experiment.</li> <li>2. Identifying and utilizing in a safe manner specialized laboratory glassware.</li> <li>3. Assembling laboratory apparatus as required for the experiments performed in this laboratory based on the following topics: measurements, physical properties, stoichiometry, gas laws, solution chemistry, acid/base chemistry, oxidation/reduction chemistry, atomic structure, and thermochemistry.</li> <li>4. Operating specific pieces of laboratory equipment including balances, Bunsen burners, thermometers, hot plates, stir plates, etc.</li> <li>5. Performing specific laboratory procedures such as titrations, filtrations, etc.</li> <li>6. Recognizing the difference between objective observation and subjective interpretation.</li> <li>7. Performing simple chemical and/or physical tests to identify an unknown compound by drawing logical conclusions from observed data.</li> </ol>	