Miami Dade College

Course Description

CHM1045L | General Chemistry and Qualitative Analysis Lab | 2.00 credits

This laboratory course complements the principles of chemistry covered in the CHM1045, providing hands-on experience in applying chemical concepts. Students will engage in practical experiments and data analysis to reinforce their understanding of atomic theory, electronic and molecular structure, measurement, stoichiometry, bonding, periodicity, thermochemistry, nomenclature, solutions, and gas properties. Through these laboratory exercises, students will develop critical thinking skills, learn proper laboratory techniques, and gain experience in scientific reporting. This course is designed to prepare students pursuing science careers with the practical skills necessary for advanced study in chemistry and related fields.

Course Competencies

Competency 1: The student will demonstrate proficiency in laboratory techniques by:

1. Utilizing proper safety procedures and equipment
2. Calibrating and operating various scientific instruments
3. Preparing solutions with precise concentrations
4. Performing accurate measurements and recordings
5. Implementing proper waste disposal methods
6. Maintaining a detailed and organized laboratory notebook
7. Troubleshooting experimental setups and procedures

Competency 2: The student will apply chemical concepts through experimentation by:

1. Designing experiments to test hypotheses
2. Conducting investigations on atomic and molecular structures
3. Analyzing stoichiometric relationships in chemical reactions
4. Examining bonding theories through practical applications
5. Investigating periodicity trends experimentally
6. Exploring thermochemical principles in reactions
7. Studying gas laws through hands-on demonstrations

Competency 3: The student will develop data analysis and interpretation skills by:

1. Collecting and organizing experimental data systematically
2. Applying statistical methods to evaluate data precision and accuracy
3. Creating graphs and charts to represent experimental results
4. Identifying sources of experimental error and uncertainty
5. Drawing conclusions based on experimental evidence
6. Comparing experimental results with theoretical predictions
7. Proposing explanations for discrepancies between theory and practice

Competency 4: The student will enhance scientific communication abilities by:

1. Writing comprehensive laboratory reports following scientific formats
2. Presenting experimental findings through oral presentations
3. Developing clear and concise abstracts summarizing experiments
4. Critiquing peer reports and providing constructive feedback
5. Discussing experimental results in group settings
6. Explaining complex chemical concepts using appropriate terminology
7. Formulating research questions based on experimental observations

General Education Learning Outcomes

- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information