Miami Dade College

Course Description

CHM2211L | Organic Chemistry 2 Lab | 2.00 credits

Students will learn to reinforce and illustrate topics learned in CHM2211. Topics include nomenclature, preparation reactions, and electronic and structural features of alcohols, ethers, phenols, aldehydes, ketones, carboxylic acids, acid anhydrides, amides, esters, and other organic compounds will be performed in a laboratory setting.

Course Competencies:

Competency 1: The student will conduct chemistry experiments using proper safety procedures, recognizing and responding appropriately to potentially hazardous situations, and recognizing the necessity of safe laboratory practices by:

1. Reviewing the safety rules introduced in general chemistry labs and in CHM2210L
2. Locating and demonstrating expertise the use of safety equipment such as fire extinguishers, fire blanket(s), eye wash station, safety shower, spill clean-up kits, etc.
3. Conducting scheduled experiments in accordance with general safety rules in addition to new instructions unique to each CHM2211L experiment
4. Demonstrating expertise in disposing, dispensing, measuring, and diluting oxidizers, reducers, flammable substances and lachrymators properly in accordance with strict rules regarding solubility, reactivity, and flammability

Competency 2: The student will able to clearly communicate (in writing) information gathered from the laboratory manual and other sources of literature pertaining to the experiments being performed by:

1. Demonstrating advanced writing skills, the ability to analyze, evaluate, compare, and/or extract data relevant to each chemistry experiment
2. Evaluating the validity of information obtained in the laboratory by comparing it to information obtained from the accepted chemical literature to a higher level than in previous chemistry labs
3. Demonstrating with the use of diagrams, drawings, outlines, concept maps, and/or other methods the connections among chemical concepts to a higher level than in previous chemistry labs
4. Demonstrating the ability to use the appropriate technology common to both previous chemistry labs and specific to CHM2211L to carry out appropriate experiments
5. Completing required laboratory reports including proper representation of data, analysis of data, and discussion of results and demonstrating expertise in these tasks, learned in previous chemistry labs
6. Writing logical conclusions from experimental results showing a mastery of the process

Competency 3: The student will be able to apply appropriate mathematical tools to accurately determine calculated results from experimental data by:

1. Setting up problems and performing calculations related to area under the curve, stoichiometric ratios of reagents, percent composition of an unknown sample, proton ratios from nuclear magnetic resonance (NMR) data, conversion of units such as wavenumber, wavelength, and frequency
2. Interpreting spectroscopic evidence from NMR and infrared (IR) spectra

Competency 4: The student will be able to demonstrate laboratory skills in the performance of an experiment by:

1. Discussing the theoretical background for each experiment by reading the material provided and answering assigned open-ended questions and/or solving related problems before/after each increasingly challenging experiment
2. Selecting the appropriate glassware for a procedure, and using the glassware properly and safely to perform a given laboratory task
3. Assembling more complex laboratory apparatus as required for the experiments
4. Utilizing basic organic chemistry laboratory techniques to carry out reactions, separate, and purify products
5. Utilizing spectroscopic laboratory techniques to identify an unknown sample

Competency 5: The student will demonstrate proficiency in instrumental techniques as prescribed in the scheduled experiments by:

1. Applying written instructions regarding set-up such as sample/solvent preparation and properly interpret setup of instrumentation
2. Manipulating instrumental controls and parameters as prescribed in each scheduled laboratory write-up
3. Justifying results by analysis of data obtained from chemical instrumentation

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