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 CHM2210L.
2. demonstrating and locating expertise using safety equipment such as fire extinguishers, fire blanket(s), eye wash stations, safety showers, 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 indisposing, 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 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 and the ability to analyze, evaluate, compare, and 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 using diagrams, drawings, outlines, concept maps, and other methods, the connections among chemical concepts are higher than in previous chemistry labs.
4. Demonstrating the ability to use the appropriate technology standard for both previous chemistry labs and 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 determine accurately calculated results from experimental data by:

1. Setting up problems and performing calculations related to the following topics:
    a. 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, 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 it correctly and safely to perform a laboratory task.

3. Assembling more complex laboratory apparatus as required for the experiments.
4. Utilizing basic organic chemistry laboratory techniques to conduct reactions and 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 correctly interpreting instrumentation setup.
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.

Learning Outcomes:

- Communicate effectively using listening, speaking, reading, and writing skills
- Use quantitative analytical skills to evaluate and process numerical data
- Formulate strategies to locate, evaluate, and apply information