

**Course Description****CHM2210L | Organic Chemistry 1 Laboratory | 2.00 credits**

Students will learn to reinforce and illustrate topics learned in CHM2210. Topics such as nomenclature, preparations, reactions and electronic and structural features of alkanes, alkenes, alkynes, alkyl halides, aromatic hydrocarbons and other organic compounds will be performed in a laboratory setting.

**Course Competencies:**

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

1. Enforcing the safety rules learned in General Chemistry labs
2. Locating and demonstrating knowledge of using safety equipment such as fire extinguishers, fire blanket(s), eye wash stations, safety showers, spill clean-up kits, etc.
3. Conducting scheduled experiments strictly following general safety rules and new instructions unique to each CHM2210L experiment
4. 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 be 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 in writing the ability to analyze, evaluate, compare, and extract data relevant to each chemistry experiment by properly maintaining an organic chemistry notebook
2. Evaluating the validity of information obtained in the laboratory by comparing it to information obtained from the accepted chemical literature
3. Demonstrating the connections among chemical concepts using diagrams, drawings, outlines, concept maps, and other methods
4. Completing required laboratory reports, including proper representation of data, analysis of data, and discussion of results after completing each organic chemistry experiment

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

1. Setting up problems and performing accurate calculations related to the following topics: stoichiometry in organic reactions, limiting reagents, percent yield, and optical rotation
2. Constructing graphs of organic laboratory data and evaluating the results based on principles related to the CHM2210 course material

**Competency 4:** The student will be able to build up laboratory skills developed over a year of General Chemistry labs and expand them to include basic organic chemistry processes by:

1. Discussing the theoretical background for each experiment by reading the material provided, answering assigned open-ended questions, and solving related problems before and after each experiment
2. Identifying organic chemistry laboratory glassware, selecting the appropriate glassware for a procedure, and using the glassware properly and safely to perform a given laboratory task
3. Assembling laboratory equipment correctly for the experiments performed based on the following topics: distillation, recrystallization, reflux, steam distillation, thin layer chromatography, and melting point determination
4. Analyzing experimental results and detecting the presence of different organic functional groups and structural features of organic compounds
5. Performing chemical and physical tests to determine the identity of an unknown compound by drawing logical conclusions from observed data
6. Performing specific laboratory procedures such as distillation, recrystallization, melting point determination, and separations using a separatory funnel

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

1. Using written instructions regarding set-up such as sample and solvent preparation
2. Manipulating instrumental controls and parameters as prescribed in each scheduled laboratory write-up
3. Interpreting data obtained
4. Using data obtained to support reported results
5. Demonstrating the ability to use the appropriate technology to fulfill course requirements

**Learning Outcomes:**

- Solve problems using critical and creative thinking and scientific reasoning
- Demonstrate knowledge of ethical thinking and its application to issues in society
- Describe how natural systems function and recognize the impact of humans on the environment