CHEM C220L: ORGANIC CHEMISTRY A LAB

Item	Value
Curriculum Committee Approval Date	10/17/2008
Top Code	190500 - Chemistry, General
Units	2 Total Units
Hours	108 Total Hours (Lab Hours 108)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• CL Option 1 Natural Sciences (CB1)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5C Laboratory Activity (5C)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5C Laboratory Activity (5C)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B3 Laboratory Activity (B3)

Course Description

Formerly: CHEM C221. The laboratory component of Organic Chemistry A emphasizes basic organic chemistry theory and the techniques of separation, purification, synthesis, and analysis of organic compounds, including chromatography and instrumental methods, such as infrared and nuclear magnetic spectroscopy. PREREQUISITE: CHEM C185. COREQUISITE: CHEM C220. Transfer Credit: CSU; UC. C-ID: CHEM 150, CHEM 160 S.**C-ID:** CHEM 150, CHEM 160 S.

Course Level Student Learning Outcome(s)

1. Use logic and critical analysis to interpret data produced from infrared spectroscopy.
2. Employ common techniques in organic chemistry, including melting points, recrystallization, distillation, extraction, polarimetry, thin-layer, gas and column chromatography, and infrared and NMR spectroscopy.
3. Interpret infrared, 1H and 13C NMR spectra or mass spectrographs of an organic compounds.
4. Collect, record, and critically analyze scientific data and effectively communicate observations and conclusions using a laboratory notebook and written laboratory reports.

Course Objectives

- 1. Perform organic chemistry laboratory experiments in an efficient, safe, and effective manner.
- 2. Provide reasonable formulations of compounds from their infrared, 1H, and 13C NMR spectra and assign and explain the signals in these spectra.

Lecture Content

Safety Writing Laboratory reports Melting point Recrystallization Extraction Thin layer chromatography Column chromatography Distillation/Simple fractional distillation Nucleophillic Substitution: relative reactivities Elimination reactions Synthesis of an Ester/ a Carboxylic Acid Dehydration of Alcohol Extraction and purification of natural products Spectroscopy: UV, IR, NMR

Lab Content

Laboratory safety Awareness and use of hazardous compounds Techniques: Melting and boiling points Crystallization Extraction Filtration Distillation Polarimetry Infrared Spectroscopy Refractive Index Thin Layer Chromatography Column Chromatography Vacuum Sublimation Nuclear Magnetic Resonance (NMR) spectroscopy

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)
- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Instructional Techniques

Demonstration Hands-on Laboratory Activities Simulations Video demonstrations

Reading Assignments

Pre-Lab exercises Post-Lab exercises

Out-of-class Assignments

Laboratory Reports

Demonstration of Critical Thinking

All of the laboratory reports and quizzes will require problem solving strategies; some require explanations of reaction mechanisms.

Required Writing, Problem Solving, Skills Demonstration

Completion of Lab assignments.

Eligible Disciplines

Chemistry: Masters degree in chemistry OR bachelors degree in chemistry or biochemistry AND masters degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Pavia, Donald L., Lampman, Gary M., Kriz, George S., Engel, Randall G. A Microscale Approach to Organic Laboratory Techniques, 6th ed. Cengage Learning, 2018

Other Resources

1. Coastline Library