

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: CHM 246 **Credits:** 2

Course Title: Organic Chemistry II Laboratory

Course Description:

Introduces various methods and procedures used in present day organic laboratories. Covers the general techniques, organic synthesis, and the use of common spectroscopic instrumentation; synthesizing a variety of compounds; and analyzing the products through physical properties and spectroscopy. Part II of II. Lecture 1 contact hour. Lab 3 contact hours. Total 4 contact hours. 2 credits.

General Course Purpose:

Explores the physical properties and reactivity of organic compounds including common methods of separation, purification, and instrumental analysis. (Continued from CHM 245)

Course Prerequisites/Corequisites:

Prerequisite: CHM 245; Corequisite: CHM 242.

Course Objectives:

Upon completing the course, the student will be able to:

Continued: Safety in the Organic Laboratory

- Use proper procedures and regulations for safe handling and use of chemicals in the organic chemistry laboratory

Continued: Lab notebook

- Maintain a lab notebook and demonstrate proper recording, organization, and interpretation of scientific data

Application of Laboratory techniques from CHM 245

- Formulate and perform the laboratory synthesis, purification, and characterization of the organic compounds studied; applying techniques covered in CHM 245.
- ¹H and ¹³C NMR Spectroscopy
- Interpret spectra and identify compounds

Synthesis and analysis

- Preparation and analysis of a variety of organic compounds.
- Perform theoretical yield, percent yield, and percent recovery calculations.
- Potential reactions to be studied include: Grignard reaction, EAS reaction, Fischer esterification, aldol condensation, polymers
- Additional lab experiments that could be included: Synthesis of biodiesel,

- Diels-Alder, oxidation/reduction reactions, free radical halogenation, synthesis of aspirin, hydroboration-oxidation of alkenes

Mechanism

- Propose mechanisms for all reactions.
- Theoretical understanding
- Explain the theoretical basis of all techniques and state reasons for use of specific reagents.

Major Topics to be Included:

- Continued: Safety in the Organic Laboratory
- Continued: Lab notebook
- Application of Laboratory techniques from CHM 245
- ^1H and ^{13}C NMR Spectroscopy
- Synthesis and analysis
- Mechanism
- Theoretical understanding

Effective Date/Updated: August 1, 2023