Master Syllabus

Administrative Unit: Science Department

Course Prefix and Number: CHEM 210L

Course Title: Organic Chemistry I Laboratory

Number of: 2 Credit Hours: 2 Lecture Hours: 0 Laboratory Hours: 3

Catalog Description: Laboratory experiences to complement CHEM 210 focusing on separation/purification techniques. Students majoring in Chemistry must earn a grade of C or better. $20 Lab fee. Offered Fall.

Prerequisite(s)/Corequisite(s): CHEM 210.

Text(s): Suggested texts; current editions of:

- Microscale and Miniscale Organic Chemistry Laboratory Experiment. Schoffstall, Gaddis, Druelinger.

Course Objectives:

- To become familiar with standard rules and practices of laboratory safety.
- To acquire facility with laboratory equipment used in organic chemistry.
- To use the scientific method to design and conduct experiments.
- To perform and evaluate experiments in basic separation techniques.
- To use critical analysis skills to interpret data and draw conclusions.
- To develop more sophisticated skills in keeping a lab notebook and writing scientific reports.

Measurable Learning Outcomes:

- Use material safety data sheet database to locate MSDS for specific chemical substances
- Extract information from MSDS sheets to determine molecular formula, hazards, physical properties, exposure limit, personal protective equipment, first aid, and disposal procedures
- Describe the use and operation of different types of safety equipment found in the lab, including eye safety and other personal protective equipment
- Explain the current chemical hygiene safety plan and OSHA regulations on laboratory safety
- Provide an overview of how to handle flammable, volatile, health hazardous, and corrosive chemicals, and how to handle waste chemicals
• Accomplish experimental manipulations using lab equipment such as melting point apparatus, distillation equipment, chromatography apparatus
• Perform mathematical calculations to determine theoretical yield and percent yield
• Identify an unknown, based on melting point
• Perform basic separation techniques, including recrystallization, distillation, extractions, centrifugation, and chromatography
• Successfully perform chemical syntheses and isolate measurable quantities of the final product
• Demonstrate understanding of the scientific method by using it in the design and analysis of experiments

Topical Outline (major areas of coverage):
• Safety rules
• Melting point analysis
• Recrystallization
• Distillations
• Extractions
• Chromatography
• Dehydrohalogenation
• Preparation of an alkyl halide
• Sublimination
• Photohalogenation (optional)

Recommended maximum class size for this course: 20

Library Resources: Online databases are available at http://www.ccis.edu/offices/library/resources.asp. You may access them from off-campus using your eServices login and password when prompted.

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Date: September 27, 2005

NOTE: The intention of the master syllabus is to provide an outline of the contents of this course, as specified by the faculty of Columbia College, regardless of who teaches the course, when it is taught or where it is taught. Faculty members teaching this course for Columbia College are expected to facilitate learning pursuant to the course objectives and cover the subjects listed in the topical outline. However, instructors are also encouraged to cover additional topics of interest so long as those topics are relevant to the course’s subject. The master syllabus is, therefore, prescriptive in nature but also allows for a diversity of individual approaches to course material.

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