

Chemistry 2100 Syllabus Spring 2019

Organic Chemistry Lab I

Class Time and Location: Friday 8:00 AM -12:45 p.m.

Location: Petit Science Center 362

Instructor: David Connors dconnors@gsu.edu

Office: 202 Courtland North

Office Hours Monday 11:30 AM-1:30 PM, Th 1-3 PM, or by appointment.

Please send emails with your GSU email and put the course title in the subject line.

Text and Materials

GSU Chemistry 2100 Lab Manual (provided the first lab period)

Hard bound lab notebook

Safety glasses or goggles

Optional References

Introduction to Spectroscopy by Pavia, Lampman and Kriz

Experimental Organic Chemistry by Wilcox and Wilcox

Grading

Final Exam	100 pts
Final Report	100 pts
Worksheets for Weeks 1-4	60 pts
<u>Homework/Notebook*/Quality of class performance (Quizzes, Preparation,etc.)</u>	<u>140 pts</u>
Total	400 pts

*Notebook must be submitted to receive a passing grade

A+: 96% A: 92%; A-: 89%; B+: 86% B: 82% B-: 78%, C+: 76% C: 72% C-: 68% etc

Please provide me with a schedule of your *Religious Holiday Observance* by the second week of class.

Important Dates

Tuesday May 5th

Last day to withdraw with grade "W"

Friday April 26th

Final Exam during pre-lab lecture.

Wednesday May 1st

Final report and Notebook are due by 12 PM

Course Overview

This course is broken into two parts: In the first part you will isolate compounds from natural products and practice distillation of a known liquid. The second part of the course consists of identification of three unknown liquids. The liquids are distilled and then characterized using infrared spectroscopy (IR), mass spectrometry (MS) and chemical derivative tests. Lectures throughout the semester will cover the principles of IR and MS and how to interpret their spectra to identify a compound. Quizzes and homework will be given at the instructor's discretion.

Part 1

Weeks 1-5. Isolation and purification of organic compounds. Midterm reports is for the first 4 experiments only.

Part 2

Weeks 6-13. Identification of unknown compounds. Your final report will consist of the identification of three unknown liquids. One of the unknowns will be given to you as a pure liquid, but the other two will be given as a mixture. The boiling points of the unknowns will be determined by distillation and the compounds will be further identified using IR, MS and chemical tests. You will then write a final report and the details are given in the lab manual.

Honors Students

You will be responsible for identifying 4 unknown liquids. One pure liquid, but the three as a mixture that must be separated.

Date	Week		Lab Work
Jan 18	1		Check in
Jan 25	2		Extraction of Trimyristin from Nutmeg
Feb 1	3	WS 1 Due	Extraction of Caffeine from Tea
Feb 8	4	WS 2 Due	Benzoic Acid/Acetanilide Extraction
Feb 15	5	WS 3 Due	Esterification of Acetic Acid
Feb 22	6	WS 4 Due	Simple Distillation of Unknown Pure Liquid
March 1	7		Fractional Distillation of Unknown Liquid Mixture
March 8	8		Gas Chromatography of Mixture and Fractions
March 15	9		Infrared Spectroscopy
March 22			Spring Break
March 29	10		Chemical Tests
April 5	11		Mass Spectrometry
April 12	12	Last day to obtain GC	Continue Lab Work to Identify Unknowns
April 19	13		Continue Lab Work to Identify Unknowns
April 26	14	Final Exam	Clean up and Lab Check-out
May 1			Final Report and Notebook due by 12 pm

This schedule is tentative, and deviations may be necessary.

Final Exam

Your final exam will consist of all of the calculations and concepts covered during the course. Below are some examples of the topics from the course.

1. All concepts and techniques from the first four labs: extraction, sublimation, recrystallization, solubility, melting point, etc.
2. All of the chemical tests to determine functional groups that are covered in the book. You are responsible for knowing all of the tests, not just the tests you have carried out.
3. Simple and fractional distillation.
4. Concepts of Gas Chromatography (GC) and how to determine the percent composition of a mixture.
5. Infrared (IR) spectroscopy interpretation is 35% of the final. Practice using the homework and quizzes.
6. Mass spectrometry and fragmentation patterns.

Course Rules

1. Attendance is expected at every lecture and lab. Signing in and out of the lab is required.
2. All measurements must be recorded in **ink** in the student's lab notebook at the time the measurement was made. Unannounced grading of the lab notebooks will be performed during the lab.
3. **Safety glasses are required and must be worn at all times in the lab.** They can be purchased from the GSU bookstore, the Georgia bookstore or a hardware store. If you do not have safety glasses you may purchase them from the lab coordinator using a breakage form.
4. **Gloves must be worn when handling chemicals.**
5. **SAFETY!!** Students must follow all safety procedures. Failure to follow proper safety procedure will result in **EXPULSION** from that lab.

Below is a tentative schedule for the course. Changes will be necessary and will be announced in class.

DEPARTMENT OF CHEMISTRY POLICY STATEMENT REGARDING STUDENT INTEGRITY:

The Department of Chemistry follows the university policy on academic honesty published in the "Faculty Affairs handbook" and the "On Campus: The Undergraduate Co-Curricular Affairs handbook."

Any suspected offenses may be referred to the Department Chair for appropriate action.

All tests taken must represent your individual, unaided efforts. To receive or offer information during an examination is cheating. The use of unauthorized supplementary materials during tests is also cheating.

All laboratory work performed during this course must reflect your individual effort. Only original data obtained by your own laboratory experimentation are to be used, except when specifically authorized by your laboratory professor. Data from supplementary sources (handbooks, reference literature, etc.) must be clearly referenced (title, author, volume, page(s), etc.). Falsification or destruction of data constitutes cheating.

Disability Statement

Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing the course, please take time to fill out the online course evaluation.