

Welcome to Chemistry 3AL

The goal of this laboratory course is to introduce you to the theory and techniques of experimental organic chemistry. Furthermore, through a combination of lecture and laboratory you will be exposed to a variety of processes and practices that are actually relevant to many aspects of your everyday life. An equally important goal of this course is to teach you how to navigate through the laboratory in a safe and efficient manner. Awareness of the health and safety aspects of laboratory science is fundamental to anyone interested in pursuing a career in the sciences.

Office Hours

- *Dr. Robak*: Mondays and Thursdays 3-4 pm in 327 Latimer Hall or by appointment.
- *Graduate Student Instructors*: All GSI office hours will be held in 106 Latimer Hall. The schedule will be posted on the course website. You may attend the office hours held by any GSI, not only the ones held by the GSI for your lab section. These office hours are for both 3A and 3AL.

Course Website

The course website is <http://bcourses.berkeley.edu>. If you are enrolled in the course, you will have access to this site. Announcements, prelabs, and other items will be posted on this website. It is recommended that you set your notification settings to make sure that you receive emails about posted announcements.

Email

Dr. Robak: mrobak@berkeley.edu. All emails concerning Chemistry 3AL should have "Chem 3AL" in the subject line. I will attempt to respond to all emails in a timely fashion (within 1 business day). If you have not received a reply within three days, please send the email a second time.

Required Texts and Materials

- Understanding the Principles of Organic Chemistry. A Laboratory Course. 1st Edition. Steven F. Pedersen and Arlyn M. Myers. ISBN 978-1-1114-2816-7
- Organic Chemistry Laboratory Notebook. Steven F. Pedersen and Jesse H. Pedersen. Hayden-McNeil ISBN 978-0-7380-3587-1
- iClicker2 (or iClicker+)

Lectures

Lectures are held Wednesdays from 5-6 pm in 1 Pimentel and Fridays from 12-1 pm in 100 Lewis. The Friday lecture will always be a repeat of the Wednesday lecture. Please attend the lecture that you registered for so that there is enough space for everyone.

At the beginning of the semester, the purpose of the laboratory lectures is to introduce you to the principles behind the experiments you will be performing in the laboratory. The lectures will NOT serve as a "walk-through" of the actual experiment, but rather will focus on the theory and practical aspects of what you will be discovering in the lab. In the later part of the semester, after you have established a foundation of techniques used in the organic

chemistry laboratory, the lectures will turn to topics related to structure determination. Part of these lectures will not necessarily be related to any experiments being performed this semester, but will serve as a foundation to build upon in the Chemistry 3B laboratory.

iClicker

iClicker questions will be posed several times during each lecture, so that you can practice applying the concepts as they are discussed. Most iClicker questions will be scored for participation, and selected questions will be scored for correct answers. There will be a total of 5 points for iClicker during each lecture beginning with lecture B. Your two lowest scores will be dropped from grade calculations.

Each person must have and use their own iClicker. Voting in multiple lectures will be treated as cheating. Responding for another student will be treated as cheating. Any student caught with multiple iClickers in hand responding for another student will lose iClicker credit for the course, the iClickers will be confiscated, and the case will be referred to the Office of Student Conduct.

Laboratory

Laboratories are 4 hours long. You should plan on being in lab for this entire period of time. Lab notebook pages and worksheets are due at the end of each lab period unless otherwise announced.

Most experiments in Chemistry 3A are designed to have you investigate a subject(s) and then solve a problem or reach a conclusion. Many of the experiments require that you work in groups of 2-4 students so that several pieces of data can be collected and then analyzed. Group work requires cooperation and sometimes, patience. It is important to check each other's data and discuss with each other whether or not that data is consistent with what was expected. If not, then the experiment should be redone. Individuals will be graded on the group's data as well as their own. Therefore, it is important to evaluate everyone's data as though it were your own.

Please note that no person(s) in a group is to rush another group member(s) in order to finish early. If it is determined that this is occurring, the GSI will excuse the person(s) involved from lab for that day. They will also receive 0 points for that lab AND this score cannot be used as the dropped score.

Each lab experiment (or worksheet) will be worth 25 points. The lowest of the twelve scores will be dropped.

Absences

If you need to miss lab one day, that day's grade will count as your dropped laboratory score. No excuses or documentation are necessary. There will not be an opportunity to make up that lab experiment. This includes absences for reasons such as illness, travel, etc.

If you miss more than one lab period, you should make an appointment with Dr. Robak as soon as possible to discuss your situation. Bring any documentation that you feel is relevant to this meeting.

Lab Exam

There will be one written lab exam worth 80 points. This exam will be on the evening of Wed. Dec. 2 from 7:00 until 8:00 pm. The exam will cover material from both lecture and lab. Approximately one third of the points will be for questions related to NMR spectroscopy.

Note: If you already have three zeros in the course at the time of the lab exam, you do not need to take the lab exam as you have already failed the course.

Ethics

It is assumed that all work you do for this class is original. This includes the prelab, in-lab results and observations, and data analysis. You are encouraged to discuss your results with other students to help understand the results. However, once these discussions with your peers are over, everyone must write their own data analysis. All of this falls under a behavioral category I refer to as Ethical Common Sense. Unethical behavior in this class will result in an F in the course and you will be reported to the Office of Student Conduct.

Grades

The point total for this course is 400. These are broken down as follows:

- 275 points for lab experiments and worksheets (12 assignments, 25 points each, lowest score dropped)
- 45 points for iClicker (5 points per lecture, 11 lectures, lowest two scores dropped)
- 80 points for the lab exam

Grades at the end of the semester will be assigned as follows:

Grade	Includes	Points
A	A and A-	>80%
B	B+, B, and B-	65-79%
C	C+, C, and C-	55-64%
D	D	50-55%
F	F	<50%

Lab Report Grades

In order to receive points for any given lab, the following conditions must be met:

- You must attend lab.
- Prior to attending any given laboratory period you must have completed all of the reading assignments and attended the lecture preceding that experiment or lab period.
- You must prepare a prelab. If you have not prepared a prelab, you will not be allowed to perform the experiment. In general, the prelab will consist of two parts:
 - a prelab handout (printed out from bCourses and filled in) and
 - prelab notebook preparation (as specified in the handout for that week)
- You must arrive to lab on time, (for example, no later than 9:10 am for a 9:00 lab). In general, the first 10-15 minutes of every laboratory period are dedicated to a safety discussion, which is an important part of the experiment. Therefore, if you show up late you will not be allowed to participate in lab for that day.
- You must wear protective clothing and eyewear during the laboratory period. Your GSI can ask you to leave the lab for the day if you are not wearing such clothing or eyewear. Long pants and closed toe shoes are required.
- You must record detailed observations about the experiment. Do not just make a checklist of what you are supposed to do and then check off the procedures as you carry them out without making observations as to what actually happened. All observations must be written in your lab notebook during, not after, the laboratory period. *For further guidance on the requirements during the lab period, refer to Ch. 2.2 in the laboratory text.*
- You must complete the data analysis worksheet (printed with the prelab from bCourses) before you leave lab.
- Before leaving lab, you must meet with your GSI who will ask you to confirm that certain data is present in your notebook. Upon confirmation, the GSI will collect the perforated pages of your notebook that were used in lab that day, as well as the completed data analysis worksheet.
- Any questions you have regarding a lab report grade must be resolved with your GSI within one week of having received the graded lab report. All regrades are subject to final approval by the course instructor.

If you do not complete all of the above conditions for any given lab, you will receive a 0 for that experiment. The consequences of a 0 are as follows:

- If you receive one zero during the semester, this will be your dropped lab score.
- If you receive two zeros during the semester, you not only will lose the 25 points associated with that experiment, but your course grade will also be dropped by one third of a grade. For example, if you earn enough points to get a B+ in the class, but you have two zero's, you will receive a B.
- If you receive three zeros you will receive a failing grade in the course.

Schedule

Week	Lecture Topics	Reading Assignments	Lab
A	Syllabus, Intermolecular Forces 1	Chapters 1-3	Check-in, Worksheet
B	Intermolecular Forces 2	5.1-5.5	2: Solubility & Acid-Base
C	Mixed Melting Points	6.1-6.3	3: Mixed Melting Points
D	Recrystallization	7.1-7.2	5: Recrystallization of Adipic and Salicylic Acids
E	Thin Layer Chromatography 1	7.8.1-7.8.3	7: TLC of Analgesics
F	Column Chromatography and HPLC	7.8.4, 7.8.7	Handout: Separation of Excedrin Components by Column Chromatography
G	Liquid-Liquid Extractions	7.6-7.7	Handout: Separation of Excedrin Components by Extraction
H	Thin Layer Chromatography 2		8: TLC of Herbs/Spices
I	NMR 1	8.1-8.1.1	Handout: Analysis of melting point and HPLC data for Excedrin Separations (includes NMR worksheet 1)
J	NMR 2	8.1.2-8.1.3	10: Nucleophilic Substitution Reactions of Alkyl Halides (includes NMR Worksheet 2)
K	NMR 3	8.1.4	9: What Do you Take for Pain? Isolation of Naproxen
L	NMR 4/Review		Check out (in lab) NMR Worksheet 3 (Take-Home Assignment Due Mon. Nov. 30)

Calendar

Monday	Tuesday	Wednesday	Thursday	Friday
Aug 24	Aug 25	Aug 26 Lecture A	Aug 27	Aug 28 Lecture A
Aug 31 Lab A	Sep 1 Lab A	Sep 2 Lecture B Lab A	Sep 3 Lab A	Sep 4 Lecture B Lab A
Sep 7 Labor Day	Sep 8 Lab B	Sep 9 Lecture C Lab B	Sep 10 Lab B	Sep 11 Lecture C Lab B
Sep 14 Lab B	Sep 15 Lab C	Sep 16 Lecture D Lab C	Sep 17 Lab C	Sep 18 Lecture D Lab C
Sep 21 Lab C	Sep 22 Lab D	Sep 23 Lecture E Lab D	Sep 24 Lab D	Sep 25 Lecture E Lab D
Sep 28 Lab D	Sep 29 Lab E	Sep 30 Lecture F Lab E	Oct 1 Lab E	Oct 2 Lecture F Lab E
Oct 5 Lab E	Oct 6 Lab F	Oct 7 Lecture G Lab F	Oct 8 Lab F	Oct 9 Lecture G Lab F
Oct 12 Lab F	Oct 13 Lab G	Oct 14 Lecture H Lab G	Oct 15 Lab G	Oct 16 Lecture H Lab G
Oct 19 Lab G	Oct 20 Lab H	Oct 21 Lecture I Lab H	Oct 22 Lab H	Oct 23 Lecture I Lab H
Oct 26 Lab H	Oct 27 Lab I	Oct 28 Lecture J Lab I	Oct 29 Lab I	Oct 30 Lecture J Lab I
Nov 2 Lab I	Nov 3 Lab J	Nov 4 Lecture K Lab J	Nov 5 Lab J	Nov 6 Lecture K Lab J
Nov 9 Lab J	Nov 10	Nov 11 Veterans Day	Nov 12	Nov 13
Nov 16 Lab K	Nov 17 Lab K	Nov 18 Lecture L Lab K	Nov 19 Lab K	Nov 20 Lecture L Lab K
Nov 23	Nov 24	Nov 25	Nov 26 Thanksgiving	Nov 27
Nov 30 NMR Worksheet 3 Due, Lab Checkout	Dec 1 Lab Checkout	Dec 2 Exam 7-8 pm Lab Checkout	Dec 3 Lab Checkout	Dec 4 Lab Checkout