Welcome to Chemistry 3AL at UC Berkeley

Instructor: Dr. Matthew Jurow (mjurow@berkeley.edu)

Lecture Information: Friday 12-1 PM (live on zoom)
All lectures will be broadcast and recorded on Zoom.
Recordings will be posted on bCourses.

Pre/Corequisites: C- or higher in Chem 1A and 1AL.
Concurrent enrollment in Chem 3A or a C- in Chem 3A.

Lab Exam Date: Wednesday Dec 9th 5 PM

Required 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

Recommended
Some form of digital ink. Anything with some type of stylus is fine. If you do not have digital ink please attend the intro scanning session hosted by a GSI early in the term.

Lectures

To facilitate remote learning, I will post videos of the content of my lectures *well in advance* our Fri 12-1 meetings. During my live lecture time I will only add detail and explanation to challenging points and answer questions in real time. If you have specific topics you'd like me to cover in additional depth please post them on Piazza in advance.

Final Exam

There will be one written lab exam worth 30 points. **The 50 minute exam will take place Wednesday, December 9th at 5PM**. The exam will focus on material that has been covered in both lab lecture and lab. This exam MUST be taken in order to complete the class.

Course Websites

The course website is https://bcourses.berkeley.edu . If you are enrolled in the course, you will have access to this site. Announcements, spectra and other items will be posted on this website. Check this site daily to see if there are any relevant announcements that you might have missed in class.

We will also use Gradescope to collect and grade all work, including the final exam and Piazza to answer questions and host discussion. Make sure you are signed up and familiar with both of these websites.

Lab Sections

You will attend your assigned lab sections at their scheduled times by zoom. In the first two hours of this time block your TA will explain the procedures and purposes of each lab and help with any questions you have. Tuesday labs will start at 4pm.

Office Hours

You may attend the office hours held by any TA, not just your own! TA office hours will be held on Zoom. (See bCourses for schedule)

Communication

Please use Piazza as your main point of contact for any course related questions. Contact your GSI for questions about specific lab procedures and grading. Anything that needs my attention can be sent to mjurow@berkeley.edu

Ethics

We recognize that remote learning creates a unique set of challenges for collaboration and assessment. I expect your actions to reflect UC Berkeley's hard earned reputation.

All work you do for this class is expected to be original. This includes the prelab, in-lab observations, data and spectral analyses, postlab questions and exams.

Unethical behavior in this class will result in an F for the course and will be reported to the Office of Student Conduct.

Lab Assessment Materials

In an effort to preserve as many of the learning goals intended for the in person version of 3AL I have chosen not to modify either the basic framework of how you should prepare for the labs or the materials by which I will assess your understanding. While you will not physically be pouring chemicals this semester, you are expected to be familiar with the detailed procedures that you will see in the digital labs.

Digital Laboratory Experiments (10 total experiments, 15 points each, best 9 scores 135 total points)

There are 10 graded experiments. Each assignment is worth 15 points. Your lowest lab score will be dropped yielding a total of *135 points*. These labs will require:

Notebook Prep

There will be a document posted to bCourses each week outlining information to include in your lab notes for each experiment. A representative amount of information required each week is shown below:

1) A purpose of the lab
2) A numbered list of steps *outlining* the procedure of the experiment. Do not copy the procedure verbatim.
3) Predictions for any purification steps performed during a lab period.
4) A reasonable attempt at an arrow-pushing mechanism for any reactions. If the product is not known, a prediction of a possible product with an accompanying mechanism.
5) At least one question regarding the purpose of the given procedure.

Pre-lab Handouts

I will post a pre-lab question sheet that must be completed and turned in *before lab.*

Observations and Data collection

During each lab, you must record accurate data. How much of each compound did you actually measure, what solvent did you run your TLC plate in, exactly which compounds/mixtures are in each lane of the TLC plate, what different ways did you visualize the TLC plate, and where did those different spots appear, what is the melting point (if required), what is the yield (crude), what is the appearance (crude), what is the yield after purification (pure), what is the appearance after purification (pure). All of these types of observations are required for each lab.

Data-Analysis Handout

There will be a data-analysis handout that contains questions to answer regarding your results.

Worksheets (4 worksheets, 15 points each, 60 total points)

There are also four graded worksheets throughout the semester. One at the beginning as a background exercise, and three at the end of the course about nuclear magnetic resonance (NMR). None of these scores will be dropped.

Grades

The point total for this course is 225. These are broken down as follows:

- 135 points for lab assignments (*best* 9 labs; lowest lab score dropped)
- 60 points for worksheets (IMF + 3 NMR)
- 30 points for the end of semester lab exam

Grades at the end of the semester will be assigned *approximately* as follows.

Grade	Includes	Points	Percentage
A	A and A-	225-202	100-90
B	B+, B, and B-	201-168	89.9-75
C	C+, C, and C-	167-135	74.9-60
F	F	134-0	>59.9

Chem 3AL Lecture Schedule Fall 2020

Tentative schedules are provided below. Obviously now more than ever, schedules are subject to change. Any updates will be announced on the course website.

Dates	Lecture Topic*
Aug 28	Intermolecular forces & acid-base chemistry
Sep 4	Solubility (exp. 2)
Sep 11	Mixed melting points (exp. 3)
Sep 18	Recrystallization & decolorization (exp. 5/6)
Sep 25	Thin layer chromatography (exp. 7)
Oct 2	Thin layer chromatography II (exp. 8)
Oct 9	Column chromatography
Oct 16	Liquid-liquid extractions
Oct 23	Sodium naproxen analysis (exp. 9)
Oct 30	*NO LECTURE*
Nov 6	Sn1/Sn2 (exp. 10) & NMR introduction
Nov 13	*NO LECTURE*
Nov 20	$NaBH_4$ (exp. 13) & NMR
Nov 27	*NO LECTURE*
Dec 4	Review & NMR

Chem 3AL Lab Schedule Fall 2020

Dates	Experiment*
Aug 31 – Sep 4	A: Introductions & IMF worksheet
Sep 7 – 11	NO LABS
Sep 14 – 18	B: solubility & acid-base chemistry (2)
Sep 21 – 25	C: mixed melting points (3)
Sep 28 – Oct 2	D: recrystallization (6)
Oct 5 – 9	E: TLC of analgesics (7)
Oct 12 – 16	F: TLC of herbs & spices (8)
Oct 19 – Oct 23	G: column chromatography of Excedrin
Oct 26 – Oct 30	H: liquid-liquid extraction of Excedrin
Nov 2 – 6	I: sodium naproxen analysis (9)
Nov 9 – 13	NO LABS
Nov 16 – 20	J: Nucleophilic Substitution (10) + NMR #1
Nov 23-27	NO LABS
Nov 30 – Dec 4	K: $NaBH_4$ (13) + NMR worksheet #2;
Dec 7 – 11	L: NMR #3

*All “Exp. ##” refer to the corresponding experiment in the Pedersen lab text.

Calendar (See bCourses for live version):

Week of:	Lecture	Lab	Reading
Aug 24	intermolecular forces & acid-base chemistry		Ch 5.3, Ch 4.1.1
Aug 31	solubility (exp. 2)	A: Introductions & IMF worksheet	Ch 6.1, Exp 2
Sep 7	mixed melting points (exp. 3)	NO LABS	Ch 6.3, Exp 3
Sep 14	recrystallization & decolorization (exp. 5/6)	B: solubility & acid-base chemistry (2)	Ch 7.1, Exp 5/6
Sep 21	thin layer chromatography (exp. 7)	C: mixed melting points (3)	Ch 7.8.3, Exp 7
Sep 28	thin layer chromatography II (exp. 8)	D: recrystallization (6)	Exp 8
Oct 5	column chromatography	E: TLC of analgesics (7)	Ch 7.8.4, Ch 7.2.2, Ch 7.3.3, bCourses handout
Oct 12	liquid-liquid extractions	F: TLC of herbs & spices (8)	Ch 7.6.1, Ch 7.7, bCourses handout
Oct 19	sodium naproxen analysis (exp. 9)	G: column chromatography of Excedrin	Exp 9
Oct 26	NO LECTURE	H: liquid-liquid extraction of Excedrin	
Nov 2	Sn1/Sn2 (exp. 10) & NMR introduction	I: sodium naproxen analysis (9)	Exp 10
Nov 9	NO LECTURE	NO LABS	
Nov 16	$NaBH_4$ (exp. 13) & NMR	J: Nucleophilic Substitution (10) + NMR #1	Exp 13; Ch 8.1
Nov 23	NO LECTURE	NO LABS	
Nov 30	Review & NMR	K: $NaBH_4$ (13) + NMR worksheet #2;	
Dec 7	Final Exam 12/9 5-6 pm	L: NMR #3	