

## Welcome to Chemistry 3AL at UC Berkeley

**Instructor:** Pete Marsden, [petermarsden@berkeley.edu](mailto:petermarsden@berkeley.edu), 323 Latimer

**Course Information:** Tuesday, Thursday Lecture, 12-1 PM in 1 Pimentel

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

**Lab Exam Date:** Tuesday August 13 during lab lecture (12-1 PM)

### Lectures

The lectures on Tuesday will prepare students for the labs occurring on Wednesday and Thursday. The lectures on Thursday will prepare students for the labs occurring on Monday and Tuesday. This is because there are labs that occur the day before each lab lecture, therefore these lectures will seem very far ahead of what you are completing in lab. The lab lecture will help students with the pre-lab assignments as well as serve as a “what happened” and feedback cycle. Throughout the summer, I will try and add interesting topics about different drug molecules relevant today. They may or may not be related to what is happening in the lab periods, but will DEFINITELY be awesome.

### Chem 3AL Lecture Schedule Summer 2019

Dates	Lecture Topic*
6/25	Preparation for Exp. #2 Solubility intro
6/27	Exp. 2 wrap-up and Exp. 3 Mixed Melting Points introduction
7/2	Exp. 3 wrap-up and Exp. 6 Recrystallization introduction
7/4	<b>NO LECTURE! FIREWORKS AND BBQ! AND 'MURICA!</b>
7/9	Exp. 6 wrap-up and Exp. 7 Thin Layer Chromatography introduction
7/11	<b>NO LECTURE (Chem 3A has an exam)</b>
7/16	Exp. 7 wrap-up and Exp. 8 Herbs and Spices introduction
7/18	Exp. 8 wrap-up and Column Chromatography intro
7/23	Column Chromatography wrap-up and Liquid-Liquid Extraction Intro
7/25	Extraction wrap-up and Exp. 9 Naproxen intro
7/30	Exp. 9 wrap-up and Exp. 13 NaBH <sub>4</sub> intro as well as NMR intro
8/1	Exp. 13 wrap-up and More NMR information
8/6	Exp. 16 Alpha Pinene Oxide introduction and more NMR information
8/8	Exp. 16 wrap-up and NMR information and Review
8/13	<b>Lab Exam</b>

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

### 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, spectra and other items will be posted on this website. It is recommended that you check this site daily to see if there are any relevant announcements that you might have missed in class.

### Office Hours

- *Pete Marsden*: Monday and Tuesday, 1-3 PM in the chemistry library (Hildebrand). You may come to my office hours for lecture material as well as for lab material. Lab questions will be answered first, followed by lecture questions.
- *Teaching Assistants*: All TA office hours will be held in Bixby North. The schedule will be posted on the course website. You may attend the office hours held by any TA, not only the ones held by the TA for your lab section. These office hours are for both 3A and 3AL.

### Email

*Pete Marsden*: [petermarsden@berkeley.edu](mailto:petermarsden@berkeley.edu). All emails concerning Chemistry 3BL should have "Chem 3AL" in the subject line.

### Required Texts

- Understanding the Principles of Organic Chemistry. A Laboratory Course. 1<sup>st</sup> 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

### Ethics

It is assumed that all work you do for this laboratory class is original. This includes the prelab, in-lab observations and data and spectral analyses.

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.

### End of semester Lab Exam during lab lecture (30 points) (August 13, noon to 1pm)

There will be one written lab exam worth 30 points. **The exam will take place during the last week of lab lectures during the 50 minute Tuesday August 13th lecture period.** 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.

Note: If you already have three zero's 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.

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

There are four worksheets throughout the semester. One at the beginning as a background exercise, and three at the end of the summer about nuclear magnetic resonance (NMR). None of these scores will be dropped. The first two NMR worksheets will be due at the end of lab K, experiment #16. You'll be able to work on these ahead of time, which I highly suggest.

**Laboratory (10 total experiments, 15 points each, best 8 scores 120 total points)**

Laboratories are 4 hours long. You should plan on being in lab for this period of time. There are 9 graded experiments and one graded worksheet. Each assignment is worth 15 points. Your lowest lab score will be dropped leading to a total of 135 points for lab attendance and lab reports. **See the section in this handout on lab report grades to determine what is necessary for the successful completion of a lab report.** It is your responsibility to read this information. As you will see, there are important consequences associated with not attending lab and/or not turning in completed laboratory reports.

A tentative lab schedule is provided below. It is subject to change and any updates will be announced on the course website.

**Chem 3AL Lab Schedule Summer 2019**

Dates	Experiment*
6/24-6/25	A. Lab Check-In and Bonding Worksheet
6/26-6/27	B. Exp #2. Solubility and acid/base chemistry
7/1-7/2	C. Exp #3. Mixed Melting Points
<b>7/3-7/4</b>	<b>No Lab – 'Murica</b>
7/8-7/9	D. Exp #6. Recrystallization and Decolorization of Brown Sugar
<b>7/10-7/11</b>	<b>No lab (Chem 3A has an exam on 7/11)</b>
7/15-7/16	E. Exp #7. TLC of Analgesics (modified)
7/17-7/18	F. Exp #8. TLC of Herbs and Spices
7/22-7/23	G. Handout. Column Chromatography of Excedrin components
7/24-7/25	H. Handout. Liquid-liquid Extraction of Excedrin components
7/29-7/30	I. Exp #9. Analysis of Sodium Naproxen in Aleve
<b>7/31-8/1</b>	<b>No lab (Chem 3A has an exam on 8/1)</b>
8/5-8/6	J. Exp #13 NaBH <sub>4</sub> Reduction of Benzil and Benzoin. ALSO. NMR Wksht#1
8/7-8/8	K. Exp #16 Some Chemistry of Alpha Pinene Oxide. ALSO. NMR Wksht#2
8/12-8/13	L. Lab Check-Out and NMR Wksht#3
<b>8/13</b>	<b>Lab Exam – 12pm-1pm during lab lecture time.</b>
<b>8/14-8/15</b>	<b>No lab (Chem 3A Final Exam 8/15)</b>

\*All "Exp. ##" refer to the corresponding experiment in the Pedersen lab text.

**Lab Experiments: 15 points total. Broken down below.****Pre-Labs (Augmented Prelabs) (2-3 points)**

There will be a document posted to bCourses each week outlining information to add to your prelab for any given 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.
- 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 any given experimental procedure.

**Pre-lab Handouts (1 point)**

There will also be a 1 page pre-lab question sheet worth 1 point that must be completed BEFORE LAB STARTS.

**Observations and Data collection (8-9 points)**

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. There is a sample pre-lab for experiment 16 posted on bCourses that will show you ways to predict when you will need to make observations.

**Data-Analysis Handouts (2-4 points)**

There will be a data-analysis handout that contains questions to answer regarding your results. These handouts will be designed to finish during the lab period and must be turned in BEFORE YOU LEAVE LAB. On occasion, I will allow for these handouts to be turned in at the beginning of the following week's lab section.

**Lab Attendance and Lab Scores**

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

- You must attend lab.
- You must prepare a prelab following the instructions posted for each experiment.
- You must arrive to lab on time, which means no later than Berkeley time (10 minutes after the hour). 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 TA can ask you to leave the lab for the day if you are not wearing such clothing or eyewear.
- You must record all expected data during, not after, the laboratory period. This includes melting points, TLC plates, yields, etc.
- You must turn in the data-analysis handout.

**Grades**

The point total for this course is 210. These are broken down as follows:

- 120 points for lab assignments (including two dropped scores)
- 60 points for worksheets
- 30 points for the end of semester lab exam

Grades at the end of the semester will be assigned as follows. I reserve the right to lower these cutoffs (that helps you ☺):

<b>Grade</b>	<b>Includes</b>	<b>Points</b>	<b>Percentage</b>
A	A and A-	210-189	100-90
B	B+, B, and B-	188-157	89.9-75
C	C+, C, and C-	156-126	74.9-60
F	F	125-0	>59.9