Chemistry 3B – Second Semester Organic Chemistry
CHEMICAL STRUCTURE AND REACTIVITY (II)
UC Berkeley – Fall 2019
Dr. Pete Marsden – 323 Latimer – petermarsden@berkeley.edu

Location and time: 1 Pimentel Tu, Th 8:00-9:30 AM
1 Pimentel Tu, Th 3:30-5:00PM (webcast)

General Information:

Chemistry 3B is the second semester of a two-semester survey of organic chemistry. The learning goals of this course are to familiarize the students with aromatic systems, carbonyl chemistry and various biologically relevant molecules. We will focus on their mechanisms of formation as well as reaction coordinate energy diagrams.

Course Website: https://bcourses.berkeley.edu

The course website will be used for announcements throughout the semester, as well as for periodically posting selected resources. You are responsible for checking the site on a regular basis. All Homework will be posted under the Files tab. Quiz and exam grades will be found on Gradescope at https://gradescope.com.

Email: petermarsden@berkeley.edu

All e-mail concerning Chemistry 3B should have "Chem3B" at the start of the title with a reasonable description about what the email entails. Use e-mail for asking simple questions about the course or if you would like to make an appointment to see me. Do not expect detailed answers to chemical questions since organic chemistry is a very visual science and generally requires structures to explain concepts. These questions are more appropriate for office hours.

Recommended Materials (NOT REQUIRED!!!!):

- HGS Maruzen Molecular Structure Models
- D. Klein, "Organic Chemistry as a Second Language Second Semester Topics" 4th Edition, Wiley Publishing.

Exams (150 pt per midterm, 225 pt final, Total 525 pts):

- Exam #1 will be held on Friday, October 4 (7-9 pm)
- Exam #2 will be held on Friday, November 8 (7-9 pm)
- The Final Exam will be held on Monday, December 16 (3-6 pm)

Quizzes (150 points total):

Every Tuesday, there will be a 10 minute, 15 point quiz administered during the lecture. The quizzes will be closely related to the homework problems and **lecture material**. You must attend the lecture section you are signed up for according to CalCentral. There are 12 quizzes throughout the semester, I will take your best 10.

Grading: The course will be graded on the basis of **675 points**, distributed as follows:

- 10 best quizzes (15 points each for 150 total points)
- Each midterm exam is worth 150 points (total of 300 points).
- The final exam will be worth 225 points.

Course Grade

Final letter grades in this course will be based on the total points in the course. Grade cutoffs will be approximately:

A+/A/A- : 100% - 85%
B+/B/B- : 84% - 70%
C+/C/C- : 69% - 55%
F : <54%

These are only approximate cutoffs. I might lower them, depending on the actual distribution of scores throughout the semester. Traditionally, the percentage of students receiving each type of grade are as follows:

A (30-35%); B (30-35%); C (25-30%); D, F (5-10%)

This is a straight points class. The cutoffs are predetermined. There will be no additional curving of exams or quizzes. This means it is possible for every single student to earn an A in the course. To reach this goal, it is imperative that you help each other with the material, and work conceptually whenever possible.

The final exam percentage can be used to replace your lowest exam score (if that benefits your grade). I will do this automatically, and give you the highest possible points that I can.

Lecture attendance:

Organic chemistry is a concentrated and fast-moving subject. It is not inherently more difficult than other science courses, but you will probably find it different from anything you have studied previously because there is a great deal of new conceptual material to assimilate. An important aspect of the subject is that it is very **cumulative,** with each new topic building upon and using concepts developed in the previous one. Because of this close interrelationship of topics, this is not a course in which it is possible to learn some topics but ignore others. It is also very difficult to wait until a few days before the exams and final examination to begin learning the course material. Therefore, the single factor that gives students the most trouble is **falling behind.** To avoid this problem, I strongly recommend that you **work problems as soon as they are assigned. Lecture attendance is particularly important, since all exams in this course will be based on the material covered in lecture.**

Post-Lecture Worksheets

Each lecture, there will be a one-page document that will serve as a “Cliff’s Notes” style handout. After each lecture, you should be able to go through that one page and answer all of the questions. It is intended to be similar to Chem 1A discussion handouts, only they are not collected. These are designed as study aides, but are by no means necessary to complete. They will definitely help you retain the information from lecture and solidify the concepts in a small amount of time (please read as: minimum needed to pass quizzes).

Homework:

Homework sets will be posted regularly on the course website. The homework will not be graded, but is extremely important for understanding the material. Due to the fast pace of this course, it will be easy to get behind. To ensure that this does not happen, I suggest you use the lecture examples as a "warm-up". If you are struggling, be sure to go through the lecture material along with your homework questions so that you will have a set of problem solving skills to apply to the more difficult problems later on in the homework sets.

When attempting my homework sets, be sure to go through your notes at the same time. Many of the strategies outlined during lecture are directly applicable to the completion of the homework questions.

Office Hours:

Dr. Pete Marsden:

- Monday, 9-11AM 425 Latimer. Wednesday 3-5PM in 433 Latimer.
- Email – You can set up meetings with me via email. Be sure to have "Chem 3B" as part of the subject of the email (petermarsden@berkeley.edu).

Teaching Assistants: Bixby North (schedule will be posted on bCourses)

The TA office hours are spread out throughout the week, and are available on a walk-in basis to all enrolled students in both Chem 3B and Chem 3BL (lab). You may visit any TA during scheduled office hours. This is a very valuable resource and you are highly encouraged to bring questions here on a regular basis. Access to the room can be found on the northwest face of Latimer Hall, right across from Pimentel.

Head GSI – Stephen Bierschenk <stephen_bierschenk@berkeley.edu>

- Weekly Reviews from 7-9 pm in ROOM on Tuesday evenings.

Course Outline: The following topics will be discussed in the order shown below (subject to change).

Unit 1 Material

Lecture	Day	Date	Topic(s)
1	Thurs	29-Aug	Acid/Base Review
2	Tue	3-Sep	*Quiz* 1 and Allyl Systems and Conjugated Pi systems pt 1
3	Thurs	5-Sep	Conjugated pi systems pt 2
4	Tue	10-Sep	*Quiz 2* and Conjugated pi systems pt 3 and Diels Alder pt 1
5	Thurs	12-Sep	Diels Alder pt. 2
6	Tue	17-Sep	*Quiz 3* and Electrocyclizations and Aromaticity Intro
7	Thurs	19-Sep	Electrophilic Aromatic Substitutions pt. 1
8	Tue	24-Sep	*Quiz 4* EAS directing groups and SnAr intro
9	Thurs	26-Sep	SnAr and Review

Unit 2 Material

Lecture	Day	Date	Topic(s)
10	Tue	1-Oct	*Quiz 5* and Ketones and Aldehydes as electrophiles
11	Thurs	3-Oct	Hemiacetals and acetals
	Fri	4-Oct	***Exam 1 (7-9 pm)***
12	Tues	8-Oct	*Quiz 6* and Sugars pt. 1
13	Thurs	10-Oct	Sugars pt. 2
14	Tues	15-Oct	*Quiz 7* and Amine nucleophiles
15	Thurs	17-Oct	Enolates introduction
16	Tues	22-Oct	*Quiz 8* and Enolates alkylation, halogenation and aldol
17	Thurs	24-Oct	Beta dicarbonyls as well as aldol condensations
18	Tues	29-Oct	*Quiz 9* and Carbonyl vs beta carbon electrophiles
19	Thurs	31-Oct	Cuprates and Robinson Annulation
20	Tues	5-Nov	*Quiz 10* and Review

Unit 3 Material

Lecture	Day	Date	Topic(s)
21	Thurs	7-Nov	Carboxylic Acids Introduction
	Friday	8-Nov	***Exam 2 (7-9 pm)***
22	Tues	12-Nov	*Quiz 11* and Carboxylic Acid Derivatives
23	Thurs	14-Nov	Lithiates attacking derivatives and Reductions of derivatives
24	Tues	19-Nov	*Quiz 12* and Enolates of derivatives and enolates attacking derivatives and decarboxylation
25	Thurs	21-Nov	Fatty acid synthesis and amino acid introduction
	Tues	26-Nov	***HOLIDAY FOR TURKEY!***
	Thurs	28-Nov	***HOLIDAY FOR TURKEY!***
26	Tues	3-Dec	Peptide Sequencing
27	Thurs	5-Dec	Edman Degradation and Review
	Mon	16-Dec	***Final Exam (3-6 pm)***