University of California, Santa Cruz
Department of Chemistry & Biochemistry

CHEM 8B: Organic Chemistry II
Summer 2017

Instructor: Caitlin Binder, Ph.D. **Email:** cambinde@ucsc.edu
Office Hours: W 1 - 2pm (THIM 313 / 329) & TuTh 9:15 - 9:50am (Baskin 152)
Q&A 10am-12 on Aug 4, 9, 18, & 31 No 9:15 or 1pm office hours on Aug 9, 10, 24, & 31

Teaching Assistants – office hours during discussion
Ariel Kuhn – ajkuhn@ucsc.edu Gabriella Amberchan – gamberch@ucsc.edu
LSS/MSI Tutor: Leobardo Gonzalez **Email:** lgonza21@ucsc.edu
Small group tutoring – go to ARC center to activate your account; sign up on or after 8/1

Lecture: M-F 10-noon, J. Baskin Engr. 152; See lecture & exam schedule on page 6

Discussions: Consistent attendance to discussion sections is vital to your success in organic chemistry. Plan on preparing for discussion by attempting, if not completing the most recent HW assignment beforehand. Starting week 2, you may go to any or all discussion sections and treat this like TA office hours – ask questions, work on HW, or whatever you need.

* No discussion sections on 8/10 or 8/24

Required Materials

- J. McMurry, Organic Chemistry, 8th Edition, Cengage 2012
- Study Guide and Student Solution's Manual for McMurry Organic Chemistry, 8th Edition Cengage 2012
- *Optional but Highly Recommended*: Molecular Model Kit for Organic Chemistry

Summer Session Students with Disabilities: If you qualify for classroom accommodations because of a disability, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me as soon as possible, preferably within the first week of the Summer Session. Contact DRC by phone at 831-459-2089 or by email at **drc@ucsc.edu** for more information. DRC students with extra time accommodations also enrolled in 8L: prevent a time conflict exams 1 & 2. *I can arrange your exam to start early but only if you let me know in the beginning of the term.* Students cannot come to lab late for any reason; plan ahead!

Academic Integrity

Students take their own individual exams without additional resources (cheat sheets, etc). Communication between students during exams in any form will not be tolerated. Students who participate in such forms of academic dishonesty may face academic sanctions. For more information, visit **http://www.ue.ucsc.edu/academic_integrity**.

Learning Resources

Course Website *(http://acrochem.sites.ucsc.edu/chem-108b/)* - This is where you will find the reading questions, handouts provided in lecture, and other course materials. ***Course Reserves*** – the textbook and solutions manual can be checked out from the S&E library for two-hour periods. Be considerate of other students' needs for the book too! **Khan Academy Video Tutorials** can be great additions to your study routine. Peruse these in your precious free time for topics that are difficult for you. Lectures (audio & projections) are posted online 1-4 days after class (**webcast.ucsc.edu**). The username is **chem-8a** and password is **@croCh3m**. Technical issues should be addressed webcast@ucsc.edu.

Course Description

CHEM 8B is the second quarter of organic chemistry and builds on the structural and reactivity conventions of organic compounds learned in CHEM 8A. The ability to distinguish between nucleophiles and electrophiles allows students to understand a broader scope of synthetic organic reactions, including those of aromatic compounds, alcohols, amines, and carbonyl compounds. Learning the chemistry of these functional groups lays the foundation for understanding the reactivity of more complex biomolecules such as carbohydrates, proteins, and lipids.

Course/Classroom Protocol

Students are expected to treat their instructor, TA, and fellow students respectfully!

Attendance at all class sessions is necessary for successful completion of this course. It is 100% your responsibility to be present for lecture material and in-class announcements.

Please do not use your cell phone during class. This includes taking pictures; write by hand instead and use the webcasts to catch anything you may have missed. *Students can take notes with a tablet but please check with me first.* It is important that these devices are used only for course-related material. You will no longer be allowed to use your electronic device in class if you take advantage of your privilege. You will be asked to leave class if you cannot follow these rules.

Assignments and Grading Policy

Textbook reading assignments are given in the lecture schedule and are to be completed before that day's lecture. Comprehension questions pertaining to reading assignments are posted online to guide your preparation.

Homework, though not turned in for credit, is your most pivotal assignment to aid in your understanding of organic chemistry. You absolutely need to complete your homework in a timely manner if you expect to pass CHEM 8B! The homework sets that correspond to each lecture are given at the end of the syllabus.

There are no quizzes in summer organic chemistry.

Midterm Exams **(60%)** are comprehensive assessments that review in detail recently covered topics. Each exam builds on material found on previous exams. Exam questions will be similar, if not identical, to the homework and in-class examples.

The *final exam* (40%) is cumulative with a somewhat greater focus on chapters not covered on the first two exams. Please pay attention to in-class announcements about exams.

There will be no make-ups! The accelerated nature of the summer session makes it impossible to accommodate students who miss an exam. No exceptions.

A typical distribution of letter grades is as follows:

A: 100-90%; B: 89-75%; C: 74-60%

Usually, an overall score of at least 60% is required to pass. Do not rely on the curve. Instead just do your best! Plus (+) and minus (-) grades are used in special cases based on final exam scores. *For example, if the grade at the end of the term is 74% but student earned a B on the final exam, the grade will be entered as a C+. As another example, if the end of term grade is 75% but student scored 59% on the final, the grade will be entered as B-.*

Study Tips and Requirements

What "they" say about ochem is true - it is difficult and there is an incredible amount of material to learn in a short amount of time. *If done right, however, this class can be fun!* An easy way to make this a more pleasurable experience is to establish good study habits early and stick to them. The learning process is fluid and changes often need be made based on other commitments. Many of these changes can be anticipated by staying organized so that you can compensate for lost time.

In brief, follow these points and you can expect to excel in organic chemistry:

- *DO NOT FALL BEHIND!*
- *Maintain a positive attitude*
- *Do the reading assignment and review previous class notes before each lecture*
- *Take thorough lecture notes and participate*
- *Review your notes and start HW assignments soon after lecture*
- *Attend office hours regularly*
- *Actively prepare for and participate in discussion sections*
- *Re-do HW problems without "cheating" to study for tests ON YOUR OWN*
- *Keep an organized, working record of concepts/problems that are difficult for YOU*

Before lecture:

First, check the Reading Questions. This is the bare minimum material you should be familiar with before coming to lecture. Check the syllabus for the reading assignment and take *between 20-45 minutes to skim the assigned text sections*, paying special attention to bold-faced words, **figures**, equations, and example problems. It is easier to conduct a lively class discussion when both the students and instructor are prepared. I do not expect you will understand everything that you read at first, but you will derive far more benefit from lecture and will be able to participate in class discussions by reading ahead of time.

****Eat breakfast before class****

During lecture:

Be on time and stay for the duration. There will be a short break half-way through lecture so please stay put instead of getting up and disturbing your classmates. Please ask questions. Don't be shy! It can be difficult at times to write and listen so feel free to let me know if things are moving too quickly (just be nice about it please). Communication is key!

After lecture/discussion:

Put your notes side by side with the text. Re-write, or at least **re-read your notes** while supplementing your class notes with the textbook material on the **same day as lecture**. Re-do problems we did as a class that were challenging or confusing and come to office hours to clear things up. ***Begin homework promptly*** so you'll have time get help if needed. Start by writing out the questions and use the text and your lecture notes to work through each problem. Your homework is a record of your understanding and will be used to study for exams. Your "future self" will be grateful to you for making your homework neat and easy to follow. Color helps! After self-grading your completed HW, make sure you understand why you got those problems wrong (if any) and how to do it on your own in the future (there's no solutions manual during exams).

Study Tips (just a few more…)

Stay organized. Be a nerd about this. Seriously.

Studying for exams:

Studying with groups is great, but it has to be in addition to studying alone. Your classmates cannot help you during the exam! Reading your notes and re-doing problems we do as a class is key. **Re-do as many homework problems as you can, as many times as you can. Don't just look at a problem and say, "I know how to do that." Actually write it out again (wasting paper is an unfortunate drawback, but necessary).**

Practice exams are provided online. Your best bet is to re-work the homework problems and use the practice exam as a final skill-check, rather than only using the practice exam to study. **Start by building confidence with simple problems rather than jumping to the more complex problems toward the end of the HW set.** Many exams questions may come directly from the homework! Please pay attention to in-class announcements about the exams. *The Q&A sessions before exams are not review sessions.* You are highly encouraged to come to office hours before an exam with specific questions. If you ask general questions like "what will be on the exam?", my answer will be "use your lecture notes and homework to prepare for the exam."

Other Tips for Success and/or Maintaining Sanity

Patience. Some things will not make full sense right away, and letting this bother you only slows your progress. Instead, accept it and enjoy the process. Your career is for the long haul, after all. Also keep in mind that no two students are the same. You can expect to learn at a different pace than your classmates. College is actually about figuring out how *you* learn.

Breathe and Get Out! When feeling frustrated, take three deep breaths and try to start again fresh. Stress and frustration can also be alleviated with physical activity. Students tend to get caught up with classes, labs, studying, eating, etc. and exercise falls by the wayside. If you are feeling particularly overwhelmed or otherwise stuck, try going for a walk, run, or a bike ride. Try a yoga class or pick a sport and go do it! Sometimes when you just want comfort food, you'd be better off getting some exercise or at least some fresh air.

And last but not least, ***SLEEP***!!!

LECTURE SCHEDULE

Dates	Reading (McMurry 8)	Lecture Topic	Lecture No.
M 7/31	16.1-3	Introduction; Aromatic Chemistry	1
T 8/1	16.4-5	Aromatic Chemistry	2
W 8/2	16.6,9-11 17.1-3	Aromatic Chemistry Alcohols	3
R 8/3	17.4-7	Alcohols	4
F 8/4	-	*Q&A Session*	-
M 8/7	18.1-3,5-6	Ethers and Epoxides	5
T 8/8		*Before Lecture 6, read p. 712-716.*	6
	19.1-7	Aldehydes & Ketones: Nomenclature, Synthesis, Oxidation, Nucleophilic Additions	
W 8/9	-	*Q&A Session*	-
R 8/10	**EXAM 1**	**Cumulative, Focus on Chapters 16-18**	**1-6**
F 8/11		*Before Lecture 7, read p. 717-720*	7
	19.8-11	Nucleophilic Addition of Alcohols & Amines to Aldehydes & Ketones	
M 8/14	20.1-7	Carboxylic Acids & Nitriles	8
T 8/15	21.1-4,6-7	Nomenclature and Reactions of Acid Chlorides, Esters, and Amides	9
W 8/16	22.1-6	Introduction to Enols and Enolate Chemistry	10
R 8/17	23.1-3	Self-Aldol Condensation; Enones	11
F 8/18		*Q&A Session*	
M 8/21	24.1-8	Amines	12
T 8/22	25.1-5	Carbohydrate Nomenclature	13
W 8/23	25.6	Reactions of Carbohydrates	14
R 8/24	**EXAM 2**	**Cumulative, Focus on Chapters 21-24**	**1-12**
F 8/25	-	*No Lecture or Office Hours*	-
M 8/28	26.1-2	Amino Acid Structure & Titration	15
T 8/29	26.3-5,7	Amino Acids Synthesis, Peptide Primary Structure & Synthesis	16
W 8/30	27.1-3	Lipids	17
R 8/31	-	*Q&A Session*	-
F 9/1	**FINAL EXAM**	**Cumulative** **STARTS 9 A.M. ENDS 12 P.M.**	**1-17**

Homework

Work through the assigned homework problems to get a more complete understanding of the concepts presented in lecture. Homework is not checked for correctness so it is entirely up to you to check with the solutions manual on your own. This will be the focal point in discussion sections. Plan on completing or at least starting each homework set the same day of the lecture for that chapter. Do not fall behind on this. **Write the question in pen**, your response in pencil, then **self-grade your homework using red pen** with the Solutions Manual or the back of the text *after* giving your best attempt at the problem set. Do not rely too heavily on the Solutions Manual – it does have some mistakes or only one answer when many are possible. Please check with your TA or instructor if you think there is a mistake in the solutions or if you need clarification.

COMPLETING EACH HOMEWORK SET ONCE IS NOT ENOUGH TO DO WELL ON THE EXAMS (CAN YOU RECALL IN DETAIL THE PROBLEMS FROM A FEW DAYS OR WEEKS AGO?). PREVIOUS HOMEWORK SETS NEED TO BE REVIEWED OFTEN. BEFORE EACH EXAM, ACTUALLY **RE-DO** AS MANY HW PROBLEMS AS POSSIBLE – DON'T JUST LOOK AT THE HOMEWORK AND SAY "I CAN DO THAT." ACTUALLY DO IT AGAIN. EVENTUALLY, YOU CAN DO THIS WITHOUT REFERRING TO YOUR BOOK, NOTES, SOLUTIONS, OR OLD HW. YOU WILL NOT HAVE ANY OF THESE RESOURCES DURING THE EXAM. RELYING TOO MUCH ON THESE TOOLS WHILE STUDYING WILL GIVE YOU A FALSE SENSE OF CONFIDENCE.

Problems begin within the chapter and continue at the end with "Additional Problems."

Lecture	Chapter	Assigned Problems - McMurry 8th Edition *(Clarifications to solutions manual for italicized problems online)*
1	16	1,3-7
2	16	8-13, 28, 29, 36, 37 *(10,12)*
3	16 17	14, 18, 20, 22, 23, 51, 68, 72 *(22d, 23b, 68a)* 2, 4, 6
4	17	7-10, 12-15, 30, 34, 35, 41 *(7c, 14ac, 41)*
5	18	3, 5, 7, 14, 23, 25a-d, 28, 30acde, 43, 55 *(3,28,30de,55)*
6	19	2-5, 7, 40bdef *(3c, 4cd, 5, 7)*
↑ Problems for Exam 1		
7	19	10, 11, 13, 14, 16, 17, 40gh, 48, 58 *(11, 14, 48)*
8	20	2(skip e),7,9a,10,11,13,26,33,35,48,57 *(33cde,35a, 48)*
9	21	2a-f, 3-5(skip 5d), 7, 9, 11-13, 17-21, 34-36, 38, 62 *(5a,7,9,11,12,20b,36c,38aeg)*
10	22	1, 2, 4-6, 20-22, 24, 25cd, 30, 34, 45abef *(5, 45f)*
11	23	1, 3-4, 27, 29
12	24	2a-e,4 6, 8, 9, 11, 17,19, 36a-e, 40(skip d), 47cd, 50ade (*36bc*)
↑ Problems for Exam 2		
13	25	Carbohydrate Worksheet #1-4 (online)
14	25	16-23, 43, 66 and Carbohydrate Worksheet #5-6 (online)
15	26	Practice amino acid titrations (pH 0-14) given pKa values
16	26	3, 5, 9, 32, 38a Amino Acid & Peptide Problems (online)
17	27	1-5, 15, 17, 20-22, 25, 35, 40, 46 (*40*)
↑ Problems for Final Exam		