University of California, Santa Cruz, Department of Chemistry & Biochemistry
CHEM 8B: Organic Chemistry
Winter 2017

Instructor: Dr. Caitlin Binder **Email:** cambinde@ucsc.edu **Office:** Thimann Labs 313
Office Hours (OH): Tuesdays 2-3:30 & Thursdays 12:30-1:30 *in PSB 240*
*No OHs 1/31, 2/28; *Extra OHs Mondays before exams: 1/30, 2/27, 3/20 @ 12-1:30 in PSB 240*

Teaching Assistants – office hours TBA

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Lecture: TuTh 9:50 – 11:25 a.m., Classroom Unit 2. See attached schedule.

Discussions: Consistent attendance to discussion sections is vital to your success in organic chemistry. Prepare for discussion by attempting, if not completing the most recent HW assignment beforehand. Quizzes are given in discussion from the homework (no make-ups without prior arrangements). Section switching after the drop/add period is discouraged but you may ask your TA to attend a different discussion for the whole quarter. Do not jump around to different sections each week! *No discussions on 1/16, 1/31, 2/1, 2/20, 2/28, 3/1.*

Required Materials

- J. McMurry, Organic Chemistry, 8th Edition, Cengage 2012
- Study Guide and Student Solution's Manual for McMurry Organic Chemistry, 8th Edition
- Separate notebook for homework only – allowed during quizzes
- *Optional but Highly Recommended*: Molecular Model Kit for Organic Chemistry

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 quarter. Contact DRC by phone at **831-459-2089** or by email at **drc@ucsc.edu** for more information.

Academic Integrity

Students will take their own individual quizzes and exams without additional resources (cheat sheets, phones, etc). Communication between students during exams in any form will not be tolerated. Students found participating in such behavior will be promptly removed from the exam or discussion room and at minimum given a zero on that quiz or exam. For more information on campus policies, 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 electronic versions of lecture handouts, practice exams, updated syllabus, etc.

Small group tutoring session provided through MSI. Interested students sign up in the beginning of the quarter to attend the same session each week. More details TBA. This is not a substitute for discussion sections.

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.

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.

The use of electronic devices is not permitted in the classroom while lecture or discussion is in session, *unless prior permission is obtained from the instructor in writing*. *This includes using a computer, ipad, tablet, smartphone, etc.* Calls, texting, and any other use of electronic devises during lecture are prohibited. You may be asked to leave class if you cannot follow these rules. Here's why: Students write answers on exams and quizzes with pen and paper. Taking notes in lecture with the same tools will be useful in exam preparation. Electronic devices can be distracting to the instructor and to other students, not to mention a tempting distraction for you!

Assignments and Grading Policy – Course total out of 1000 points

Quizzes **(300 points, 30%)** will be given in discussion and are unannounced. The material in the quizzes will be directly from the homework due that week. *You can use your homework during quizzes but no other reference tools (no text or lecture notes).* Make-up quizzes are only allowed if students arrange to go to another one of their TA's sections in that same week. This arrangement must be made before your enrolled section.

Textbook reading assignments are given in the lecture schedule and are to be completed before that day's lecture. Reading Comprehension Questions pertaining to assignments are posted to help you make efficient use of reading time before lecture.

Homework must be completed in a designated, bound notebook in order to be used during quizzes. A**lthough not turned in for credit, HW your most pivotal assignment to aid in your understanding of organic chemistry.** HW sets corresponding to each lecture are given at the end of the syllabus with 'due' dates. Quizzes and many exam questions will come directly from homework.

Midterm Exams **(400 points, 40%)** are two-hour 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* (300 points, 30%) is three-hours and cumulative with a somewhat greater focus on chapters not covered on the first two exams. Please pay attention to in-class announcements about exams. **Final exam date is Tuesday, March 21, 12 – 3pm in Classroom Unit 2.** ***There will be no make-ups exams, no exceptions****! Plan accordingly.*

A typical distribution of letter grades is as follows:

A: 90.00-100%; B: 75.00-89.99%; C: 60.00-74.99%
C-: 55.00-59.99%; D: 50.00-54.99%; F < 50%

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

This class requires more than just going to lecture and discussion, doing your homework on time, and preparing for exams. Make the most out of your experience by living the science nerd lifestyle – one where you're scheduled to spend at least 30-60 minutes every day with the material in some form. If done right, 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.

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 – instructor & TA
- 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 Comprehension Questions. This is the bare minimum material you need to be familiar with before lecture. You should be able to find the solutions to these questions relatively easily within the assigned reading. 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. 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.

Mechanism Notebook. Add one reaction and full mechanism per page with references to the chapter. Proper arrow-pushing is a necessity for passing organic chemistry. Keep in mind that you are not responsible for the mechanism for every reaction. **Please do not ask "which reactions and mechanisms are covered on the exam?"** As a general rule, if it's covered in lecture or the homework, you are responsible for it. Same goes for reactions learned in 8A – they will show up in lecture or homework if you need to know them. If you are unsure of specific reactions, you may ask specific questions but the instructors cannot possibly review every reaction you should know! Furthermore, there are helpful notes on material not covered throughout the Reading Comprehension Questions.

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, but keep in mind that the material cut-off for certain exams may be different. Your best bet is to re-work the homework problems and use the practice exam as a final skill-check.

At least once a week (whether or not an exam is coming up), set a timer for an hour and re-do as many homework problems as you can or a practice exam without using your notes of solutions. The idea is to re-create the test-taking environment to limit test-taking anxiety. It's like a scrimmage for the big game!

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 a general question like "what will be on the exam?," our answer will be "use your lecture notes and homework to figure that out."

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. 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, partying, 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

***Refer to Reading Comprehension Q's online to focus your preparation for lecture.**

Dates	Reading* (McMurry8)	Lecture Topic	Lecture No.
Tu 1/10	16.1-3	Introduction; Aromatic Chemistry	1
Th 1/12	16.4-5	Aromatic Chemistry	2
Tu 1/17	16.6,9-11 17.1-3	Aromatic Chemistry Properties of Alcohols & Phenols; Rxn Review	3
Th 1/19	17.4-7	Synthesis and Reactions of Alcohols	4
Tu 1/24	18.1-3,5-6	Ethers & Epoxides	5
Th 1/26	19.1-7	*Before Lecture 6, read p. 712-716.* Aldehydes & Ketones: Nomenclature, Synthesis, Oxidation, Nucleophilic Additions	6
Tu 1/31	**EXAM 1**	**Chapters 16-19.7**	1-6
Th 2/2	19.8-11	*Before Lecture 7, read p. 717-720.* Nucleophilic addition of alcohols & amines to Aldehydes & Ketones	7
Tu 2/7	20.1-7	Carboxylic Acids & Nitriles	8
Th 2/9	21.1-4,6-7	Nomenclature and Reactions of Acid Chlorides, Esters, and Amides	9
Tu 2/14	22.1-6	Introduction to Enols and Enolate Chemistry	10
Th 2/16	23.1-3	Self-Aldol Condensation; Enones	11
Tu 2/21	24.1-8	Amines	12
Th 2/23	25.1-4	Carbohydrate Nomenclature	13
Tu 2/28	**EXAM 2**	**Cumulative, Focus on Chapters 19-24**	1-12
Th 3/2	25.5	Carbohydrate Nomenclature	14
Tu 3/7	25.6	Reactions of Carbohydrates	15
Th 3/9	26.1-2	Amino Acid Structure & Titration	16
Tu 3/14	26.3-5,7	Amino Acids Synthesis, Peptide Primary Structure & Synthesis	17
Th 3/16	27.1-3	Lipids	18
Tuesday 3/21	**FINAL EXAM**	**Cumulative, Classroom Unit 2** **12 – 3 pm** ***NO MAKE-UP EXAMS, NO EXCEPTIONS***	**1-18**

1/27 – Last Day to Drop; **2/17** – Last Day to Withdraw, 'W' on transcript

**DRC Students – please check your class schedule to make sure there are no conflicts with the extended time you may receive for exams, especially overlaps with labs.

Homework

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?). 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 THESE RESOURCES DURING THE EXAM. RELYING TOO MUCH ON THESE TOOLS WILL GIVE YOU A FALSE SENSE OF CONFIDENCE.

Homework is not checked for credit 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 and you can refer to your HW notebook during quizzes. Quizzes are given on HW due on or before the dates below. Plan on completing or at least starting each homework set the same day of the lecture for that chapter instead of waiting for the due date. 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. You should not consider your homework complete without grading notes, with at least a check if it's correct. Do not rely too heavily on the Solutions Manual – it does have some mistakes. ***Clarifications, alternate solutions, and corrections to certain problems are addressed in a separate post on the course website.***

Lecture	Chapter	Assigned Problems - McMurry 8th Edition *(Clarifications to solutions manual for italicized problems online)*	'Due' Date*
1	16	1,3-7	1/16-1/20
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	1/23-1/27
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)*	1/30-2/3**
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)*	2/6-2/10
8	20	2(skip e),7,9a,10,11,13,26,33,35,48,57 *(33cde,35a, 48)*	2/13-2/17
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)*	2/20-2/24
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*)	2/27-3/3
↑ Problems for Exam 2			
13	25	Carbohydrate Worksheet #1-4	2/27-3/3
14	25	Carbohydrate Worksheet #5-6	3/6-3/10
15	25	16-23, 43, 66	3/13-3/17
16	26	Practice amino acid titrations (pH 0-14) given pKa values	
17	26	3, 5, 9, 32, 38a Amino Acid & Peptide Problems (online)	Before the final!
18	27	1-5, 15, 17, 20-22, 25, 35, 40, 46 (*40*)	
↑ Problems for Final Exam			

* HW assignments are not checked for credit, but there may be a quiz in section directly from HW due on or before the dates above. You must attend discussion to get credit for the quiz, no exceptions.
**There are no discussions on exam days or the day after (1/31, 2/1, 2/28, 3/1).