

Organic Chemistry II - CHEM 2320-001 - Spring 2013

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Administrative Assistant: Ms. Katie Shelton, 1320 HEB, 585-6422, kshelton@chem.utah.edu

Supplemental Instructor: Wesley Kerman, wesleykerman@hotmail.com. Session times to be scheduled on the first day.

Graduate Discussion Leader: Kirstin Khoe, kirsten.khoe@gmail.com

Required Material

1. Smith, J.G. *Organic Chemistry*, 3rd Ed.; McGraw Hill, 2008. ISBN 978-0-07-337562-5 (any 3rd ed. Smith textbook is fine)

Other Course Materials:

2. TurningPoint XR Remote (highly recommended)
3. Smith, J.G., Smith, E.R. *Student Study Guide/Solutions Manual to accompany Organic Chemistry* 3rd Ed It is essential that you have access to the solutions manual. You may share one with friends or check one out for a few hours at a time at the library if you prefer not to purchase a copy yourself.
4. Klein, D. R. *Organic Chemistry as a Second Language*. Many students have commented that the overlap between Klein and the second semester material is not as good as the first semester. I see Klein as an excellent introduction to the important basics (electronegativity, resonance, acid/base chemistry). However, you should expect to see higher-level questions on the exams and therefore using Klein exclusively is not recommended.

Prerequisites: *No students should take Chem 2320 without a C or better in Chem 2310.* Please consider retaking Chem 2310 to improve your background. It is advantageous to take Chem 2320 and Chem 2325 (O Chem II lab) the same term.

Lecture: MWF 8:35-9:25am HEB 2008

Important Dates:

Last day to add without a permission code: Sunday, January 13

Last day to drop: Wednesday, January 16

Last day to add a class: Tuesday, January 22

Last day to withdraw: Friday, March 1

Grading:

3 midterm exams @ 100 points	= 300 points
Quiz	= 30 points
In class participation (clicker questions)	= 50 points
Discussion worksheets	= 50 points
<u>Final examination</u>	<u>= 150 points</u>
Total Points	= 580 points

I will determine three grades for each student based on the following:

1. Three midterm exams, quiz, discussion points, and the final examination.
2. Three midterm exams, quiz, the final exam, discussion points, and the clicker points.
3. Final exam. *To be eligible for this option you must take all three midterm exams and quiz or be excused by HLS from any missed exams.*

You will receive the highest of these three grades.

Discussion: *Due to space limitations you must attend the discussion section for which you are registered.* Worksheets will be handed out at the beginning of the discussion section. You will work on the problems in groups as research has shown that discussing concepts and teaching others helps you to learn the material better than just listening and writing alone. You will turn in your worksheet at the end of the period and it will be graded for effort (*not completeness*) and returned to you with feedback, when appropriate. Students that are late or do not show up will earn a 0. Your lowest 2 scores will be dropped. The problems have been chosen because they reflect the type of problems you will see on exams and are meant to be challenging. *It is to your advantage to read and complete the book problems in the relevant chapter before attending discussion and use the discussion worksheet to determine which topics will require more attention.*

Student Response System: I *highly recommend* that you purchase a **Turning Point Response Card XR remote**. This is a response system that allows you to respond to questions I pose during class. You will be graded on your answer and your in-class participation. You will receive 3 points for incorrect answers and 4 points for each correct answer. After dropping your lowest 4 scores, your percentage of points earned versus points possible will be calculated then multiplied by 50 points. Your Response Card Remote will be used every day in class, often within the first two minutes of class, and you are responsible for bringing your remote daily. Register your remote online asap and prior to class 1/14 **at the latest**. If you have not registered by this time you will lose the opportunity to earn clicker points available during class on 1/14. *See the instructions on Canvas (to be posted by Jan 7) for registration instructions.*

You must respond with your own clicker only. Anyone caught inputting answers on another student's clicker will be charged with academic dishonesty. If found guilty all parties involved you will automatically forfeit the full 50 points for the semester may face much more serious consequences. There is no penalty for a few absences during the semester. Students who miss more than 3 consecutive classes should contact HLS.

Supplemental Instruction: The Supplemental Instruction Program, called SI for short, is offered in this course to provide organized study sessions. These sessions are free and open to all students in the course and are led by an undergraduate who has done well in this subject area. Your SI leader will be attending classes, reading the material, and doing any relevant assignments to be prepared for the SI sessions. The purpose of SI is to see that each of you has the opportunity to do as well as you would like to in this course. **In SI sessions, we will work collaboratively to review, organize, and clarify the material from lectures, teach you ways to develop effective study skills for this course, and help you prepare for exams.** Your SI leader will schedule 3 meetings per week convenient to the majority of your schedules. Attendance is voluntary, and you may attend as many or as few sessions as you like. SI WORKS! Campus-wide, students who participated in SI averaged a 2.74 course grade while non-participants received a 2.28 mean grade, a **0.46 GPA difference. Those who attended SI regularly (more than 6 times) achieved even higher results** (3.09 mean GPA), a **0.81 difference from non-participants**. Something else to consider: only 13% of SI participants earned a D, E, or W. Non-participant rates are much higher (29%). I hope this data may convince you to attend regularly! For more information on the Supplemental Instruction program please visit the website at www.sa.utah.edu/lep and click on the link to Supplemental Instruction. At the end of the semester, please complete the **post-survey** accessed at www.studentvoice.com/utah/si.html to provide us with feedback on your experience with SI. Your comments are valued and important to our ability to provide you with effective SI sessions that meet your needs. Let us know what worked well and what you would change!

Buddy System: This new program is designed to help students that have struggled in the past with chemistry (C or lower in previous class), *are completely committed* to making changes to find success, and would benefit from small group sessions. Students will work in groups of three to six with a TA for the course approximately one hour per week outside of class and discussion. The goal is to establish a productive and efficient study strategy, to learn the material at a level at which you would feel comfortable teaching it, and to gain a realistic idea of your exam readiness. There are a limited number of positions available. Students that are accepted into this program will be expected to spend time studying on their own each week in preparation for the session and will also be expected *to attend each weekly session*. More than one unexcused absence or failure to prepare for sessions will be grounds for removal from the program. Groups will be assigned immediately and after the first exam. An application will be posted on Canvas.

Lecture/Exam Schedule – TENTATIVE

Day	Date	Topic	Pre-Lecture Reading
M	1/7	Introductions	
W	1/9	Dienes, Conjugation, Resonance (IMPT), UV spectroscopy	16.1-16.9, 16.15,
F	1/11	Electrophilic Addition to Dienes (review energy diagrams)	16.10-16.11
M	1/14	The Diels Alder Reaction	16.12-16.14
W	1/16	Benzene and aromaticity	17.1-17.11
F	1/18	Aromaticity	
M	1/21	No Lecture – Happy Martin Luther King Jr. Day	
W	1/23	Electrophilic Aromatic Substitution (EAS)	18.1-18.5
Th	1/24	Quiz during discussion	2310 + Chpts. 16, 17
F	1/25	Substituent Effects on EAS	18.6-18.11

M	1/28	Substituent Effects Cont'd.	
W	1/30	Synthesis of Benzene Derivatives	18.12-18.14
F	2/1	Multi-step synthesis	18.15
M	2/4	Carboxylic acids, review acid/base chemistry (impt)	19.1-19.14
W	2/6	Reduction of ketones/aldehydes – nucleophilic addition	20.1-20.6
F	2/8	Exam 1 (16-19)	
M	2/11	Reduction of carboxylic acid derivatives – nucleophilic substitution	20.7, 20.8
W	2/13	Reductions cont'd.	
F	2/15	Organometallic Reagents – Prep, reactions as BASES	20.9A-20.9C
M	2/18	No lecture – President's Day	
W	2/20	Organometallics as nucleophilies – addition to carbonyl compounds	20.9D-20.13B
F	2/22	Organometallics as nucleophilies – addition to CO ₂ , epoxides, conjugate addition	20.14-20.16, 20.17
M	2/25	Reversible Nucleophilic Additions to Ketones/Aldehydes Addition of water and alcohols to form hydrates and acetals/ketals	21.1-21.8 (<i>review OYO</i>) 21.13-21.17
W	2/27	Acetals/ketals continued – use as protecting groups	
F	3/1	Cyanohydrin formation and Addition of amine nucleophiles	
M	3/4	Wittig Reaction, finish 21	
W	3/6	Nucleophilic Acyl Substitution (NAS) reactions	
F	3/8	Exam 2 (20-21)	22
M-F	3/9-3/17	Happy Spring Break!	
M	3/18	Nucleophilic Acyl Substitution (NAS) reactions	22
W	3/20	Nucleophilic Acyl Substitution (NAS) reactions	22
F	3/22	Nucleophilic Acyl Substitution (NAS) reactions	22
M	3/25	Nucleophilic Acyl Substitution (NAS) reactions	22
W	3/27	Nucleophilic Acyl Substitution (NAS) reactions	22
F	3/29	Carbonyl α -substitution	23
M	4/1	Carbonyl α -substitution	23
W	4/3	Carbonyl α -substitution	23
F	4/5	Aldol	24
M	4/8	Aldol	24
W	4/10	Claisen	24
F	4/12	Michael Addition, Robinson Annulation	24
M, W, F	4/15-4/19	Special topic: radicals, amino acids/proteins, carbohydrates, polymers, organometallic chemistry... you choose!	
M	4/22	Exam 3 (21.xx-24, ?)	
W	4/24	Review and Prepare for Final Exam	
Tu	4/30	(8-10 am) CUMULATIVE FINAL EXAM	

NOTICE: This schedule is subject to change. We will discuss the schedule and exam dates at our first meeting.

Exams: The focus of each exam will be on the chapters recently covered in the lecture and associated homework and discussion problems. However, realize that we will continually be building on the fundamentals so you will be responsible for all material covered prior to the exam.

Under certain justified circumstances students may take tests early or late. Please contact me ahead of time to make arrangements. **NO MAKEUP EXAMS** will be given. Please contact me if miss an exam for a valid reason so that I may excuse you from the exam. If the exam is excused the final class grade will be determined from an adjusted points possible. An unexcused absence from an exam will *result in a score of zero*. NOTE: Exams will NOT be rescheduled because of conflicts with work schedules. The exam schedule will be set after the second lecture. Please plan accordingly.

Re-grades: It is to your advantage to compare your exam to the key posted on the course website to make sure you understand your mistakes and also to check for grading errors. If you notice a grading or addition error the exam may be submitted for re-grading. Please fill out completely the re-grade submission form available on the course website under Course Content. In the case of student-perceived grading errors or point assignment, the entire exam will be re-graded, not just the problem in question. Re-grades will be accepted up to one week following exam distribution. Return exam with attached re-grade submission form to Dr. Sebahar before/after lecture or in Room 1340 HEB. **DO NOT CHANGE YOUR EXAM IN ANY WAY. Prior to return of exams the exams may be photocopied.** Individuals who make submissions for re-grades will have the copy of the original exam and the exam submitted for re-grading compared. Discrepancies between the two will constitute academic dishonesty and will be dealt with appropriately.

All students are expected to act honestly in the course. Any and all cases of suspected academic dishonesty such as cheating, plagiarizing, or misrepresenting one's work will be dealt with severely, in accordance with the Student Code: <http://www.admin.utah.edu/ppmanual/8/8-10.html>. A single instance of academic misconduct may result in a failing grade for the course. Multiple instances of academic misconduct may result in probation, suspension or dismissal from a program, or suspension or dismissal from the University.

Hints on Succeeding in Chem 2320:

1. Examine how you did in 2310. If you were happy with the amount of material you learned and your grade – keep it up! If you were not satisfied then *something has to change* if there is any hope of doing better in 2320.
2. Take careful notes during lecture. The outline of the lecture notes will be posted on our course Blackboard site at least 24 hours in advance of the lecture. Print the notes out (4 slides/page works well) and bring to class so that you can fill in the important details/mechanisms, etc. *Re-visit your notes shortly after lecture.* Make sure that you understand the important concepts and *ask questions right away* if you do not. Many students have found that recopying the notes or summarizing the important points of each slide is helpful.
3. Do not get behind. THIS IS MOST IMPORTANT! We will be covering a large amount of complicated material in a short amount of time and each concept will build upon the knowledge you have already accumulated. *For these reasons I encourage you to stay caught up* and spend time *daily* reading the text, solving problems, and/or practicing mechanisms and synthesis. Do NOT try to CRAM or MEMORIZE. *Regular, rigorous* training for the brain is necessary to compete in this o-chem marathon! Students that have had the most success have committed many hours (~10-15) a week to mastering the material. If you find you cannot make the necessary time commitment to get the grade you want, you might consider withdrawing from the course and taking it another semester when you can spend more time on it.
4. Prepare for lecture. Spend about 10-15 minutes before each lecture *skimming* the topics in the text to be covered that day. You will be able to comprehend more during lecture and it will seem more relevant and interesting if you have a basic familiarity with the assigned material before you walk into class. Lecture will focus on the most challenging and **important** concepts from the text and the application of these concepts. Use your lecture notes as a guide to the topics that are most important then go back and read more carefully these sections in the text.
5. Practice. I highly recommend that you do all of the assigned problems from the chapters and the discussion worksheets – *early and until you have mastered the problem on your own.* One time through the discussion worksheets with the help of your friends and/or TA is *not enough.* *Download a blank copy a few weeks later to see*

how much you retained on your own. It is also helpful to do the problems embedded in the text to get a feel for how well you grasp each section. If you find you have difficulty go back and read that section more carefully. For additional practice, other organic texts can be found in HEB 3102.

The worst thing you can do for yourself is to work on problems with the solutions guide open next to you. If the following sounds familiar, STOP! “While working through problem 999 I was stuck. I glanced quickly at the answer key and suddenly the problem seemed straightforward and easy so I moved on to the next problem.”

During the exam you are ON YOUR OWN... it is to your advantage to work through the problems on your own as much as you can before consulting the solutions guide. *Struggling before the exam is better than struggling/panicking during the exam.* If you must consult the answer for guidance this means that some time before the exam will have to come back to this problem again (and again until you can finish it on your own).

6. Learn from your mistakes: Exam keys will be posted shortly after the last exam has been graded. Make sure you understand where you made your mistakes and how to correct them. Remember, everything in O-Chem builds upon the basics – chances are, if something was important enough to show up on a mid-term exam it will show up again in a slightly different form on a later exam.
7. Be realistic about your exam readiness. Sometime before the exam put yourself in a true test taking situation. You could do one of the old exams (without the answer key handy) or put together a practice test of your own by working through the homework and discussion problems in a *random order (cut up the problems and put them in a hat)*. Either way, the key is to do the problems without any additional assistance (from the solutions manual or roommate) *under time constraints*. When you are finished grade the exam, then go back to review the concepts covered in the problems you missed. Repeat until you feel comfortable and confident.
8. Study with your peers! Not only will this make your experience more enjoyable, but you will learn the material better, too. You can compare class notes with a study partner and come up with an improved set of lecture notes, discuss homework problems and create additional problems for each other. Research shows that by teaching someone else you will learn the material better and you will get a more realistic feel for how well you know the material. Convenient study areas are located in the lobby outside the chemistry office (HEB 2020) or in the organic chemistry undergraduate help room (HEB 3102).
9. Ask for help, EARLY!!! I hope that you feel comfortable coming to me with questions any time. Additionally, there are other resources available depending on your exact needs:
 - a. The Tutoring Center offers one-on-one or group tutoring sessions. More information at www.sa.utah.edu/tutoring or 581-5153.
 - b. Private tutoring: a list of available graduate student tutors is available in the Department of Chemistry Main Office (HEB 2020).
 - c. The Discussion Section Instructors for this course and others will be available to answer questions during office hours to be held in HEB 3102. The times will be posted on the course website asap.
 - d. Review sessions will be held at least two days before examinations, by request.
 - e. The Learning Enhancement Center offers a variety of workshops covering topics such as Time Management and Test Taking Skills. They also offer a course for students called Educational Psychology 2600: Strategies for College Success. It is a 3 credit hour class that helps students with study skills, research skills, testing taking skills, etc. Find out more at: <http://www.sa.utah.edu/lep/> or 581-8746
 - f. The University Counseling Center meets with students on a variety personal and academic issues www.sa.utah.edu/counsel

- g. The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and I to make arrangements for accommodations.

Suggested Homework Problems:

Chapter 16: 31-33, 34*, 35*, 38a, b, 40, 42, 44-449, 51- 64, 68, 70

Chapter 17: 32-43, 47, 48, 49a, 50, 51 61-64

Chapter 18: 35-43, 44(why!), 45a, 46, 47, 48a,b,d, 50-54, 57-66, 76-79

Chapter 19: 34-40, 42-45, 48-50, 52, 65, 66, 68-71, 73

Chapter 20: 39-43, 45-51, 53, 54, 56-62, 64-67, 69-73

Chapter 21: 45-54, 56-58, 60-69, 71-81

Chapter 22: 43-54, 56-65, 68-78, 90, 91

Chapter 23: 30, 32, 33, 34a, b, c, 36, 38, 39, 41, 46, 47-51, 52-56, 58-70

Chapter 24: 27-38, 40-42, 46-48, 50, 52-55, 57-59, 62, 69, 71