CHEMISTRY 345 – Section 2 – Fall 2016

Tu/Th 9:30 – 10:45 AM, Room 1361 Chemistry

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Office Hours: Schomaker: Fridays from 1-2 PM; 8112 Shain
Ryan Scamp (rscamp@chem.wisc.edu) M 2:25 PM, T 4:35 PM
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Website: Learn@UW

I. INTRODUCTION

Chemistry 345 is the second semester of a two-semester organic chemistry sequence. The first course in the sequence is Chem 343, and successful completion of 343 or its equivalent with a grade of C or higher is a prerequisite for enrollment in 345. There may be an override in the system where you were able to register for Chem 345 without meeting these prerequisites, but I strongly recommend you drop the course if you did not receive at least a C (and preferably, a B) in Chem 343. The lab course associated with the sequence is Chem 344, which may be taken concurrently with 345 or in a subsequent semester.

II. COURSE MATERIALS

Textbooks:

Required:
Organic Chemistry (5th or 6th edition), M. Louden.

I will assign recommended problems from both textbooks, so it is not necessary to have the 6th edition.

Recommended:
Solution Manual for Louden, *Organic Chemistry*

Other materials:

Recommended:
Molecular model kit

**These materials are available from the UW Bookstore. $AX\Sigma$ also sells model kits in the lobby during the first few weeks of class.*

You are allowed to use models during your examinations.

Course websites: This course makes extensive use of Learn@UW. Lecture notes, handouts, problem sets, reading assignments, and announcements will be posted to the course website regularly. You will also use Learn@UW to view your grades.

III. LECTURE AND DISCUSSION

Preparation: Chem 345 will cover Ch 12–13, 16–23 and 28 of Louden. Ch 1–11 and 14–15 were covered in Chem 343. Because of the cumulative nature of the organic chemistry sequence, you must be comfortable with all of the material covered in Chem 343. If you are not, I would strongly

suggest that you seek help through the Chemistry Learning Center, on-line tutorials or a private tutor. I cannot help you catch up on material you missed from Chem 343, as much as I would like to. There is simply too much to cover in Chem 345.

Lecture: Attendance is a good idea for success in this course. There are 250 students in this course and even a 70% attendance rate means I could end up repeating myself 75 times, which I guarantee I don't have the time to do. I love teaching organic chemistry and am pulling for everyone to get an "A" because 1) I am a nice person and like others to be happy and 2) I think organic chemistry is totally cool and I want you to appreciate it. I am always willing and happy to help you if you are doing to your part to keep up with the material! Lectures are designed to highlight the important concepts, provide supplemental examples in addition to examples from your textbook, help you understand broad themes of chemical reactivity and connect the basic science to advances that have greatly benefited modern society. The best approach is to read the material prior to lecture and then use lecture to clarify issues and "connect the dots" so to speak. The lecture notes posted to Learn@UW are meant to alleviate occasional absences due to illness or other unavoidable conflicts; they cannot replace the lecture itself.

Reading: Suggested reading assignments will be posted to the Learn@UW course site. The textbook provides more detailed information than the lecture can cover; all information covered in the assigned reading is fair game for exams. However, my past experience in teaching this course is that I tend to emphasize what I find most important during the lectures and the review sessions. I've never gone to the textbook to look for a "gotcha" question, but the book is still worth reading to obtain more in-depth discussions on lecture topics. I also give out assigned problem sets, where I again stress the things that I think are most important for you to know. I will sometimes draw on the textbook problems for inspiration, or occasionally use a problem directly on an exam. However, attending the lecture and working through the assigned problem sets is usually sufficient and to my knowledge, students have not found it necessary to work every single problem at the end of a chapter. If you want to do that, I'm more than happy to help out if you have questions.

On-line problems: I will not give credit for on-line homework, but some of you might find the Sapling website helpful. To sign up, go to http://bit.ly/saplinginstructions. Sapling Learning offers a grace period on payment; for most courses, this is 14 days from the first day of the term. During sign up or throughout the term, if you have any technical problems or grading issues, please send an email to support@saplinglearning.com explaining the issue. I will not provide any support for Sapling, so I will not answer any e-mails related to questions concerning this resource. For a short introductory video to using Sapling, see: https://vimeo.com/72453315.

Discussion sections: The main purpose of the discussion section is to get guided help on problem-solving. To get the most out of section, come prepared with specific questions on concepts, problems, and reading material that you find most challenging. The two TAs for your course, Ryan Scamp and Eileen Burke, are both accomplished and experienced. They may choose to run their discussion sections differently, but both will be valuable to you in better understanding the course material. Worksheets, class discussion and going over suggested and assigned homework all are possibilities. A portion of your grade will be determined by short quizzes that will be given at the end of class. These quizzes are designed to ensure that you understand the key concepts discussed in class and to help us identify trouble areas that require additional discussion.

Getting help: We will be using Piazza as an on-line forum for the class to ask questions and get feedback from myself, the TAs and fellow students. The TAs and I have multiple research responsibilities in addition to teaching, so we unfortunately cannot answer all of your questions immediately. I will TRY to be on-line to address any concerns at least once a day, most likely in

the evening around 10 PM or so. I will also instruct the TAs to have a few hours per week when they are available to answer questions on Piazza. In this manner, the entire class will have access to questions posed by other students in the course. It's also a great way to identify classmates that might be interested in setting up a study group!

To sign up: piazza.com/wisc/fall2016/345
Link to our class page: piazza.com/wisc/fall2016/345/home

In addition, I will collect the names and e-mails of students interested in setting up study groups (send an e-mail to me at schomakerj@chem.wisc.edu with the heading "CHEM 345 Study Group"). I will compile a list and make it available to all those that have contacted me.

Etiquette: Please turn your cell phone off during lecture and discussion. Using your cell phone or computer to surf the web, text, IM, etc., during class is distracting and rude, both to the instructor and to the people around you.

IV. ASSIGNMENTS AND GRADING

Homework: Five problem sets will be assigned over the course of the semester. I will not be grading these problem sets, but solutions will be provided on-line. The bulk of exam questions will be of a similar nature and level of difficulty as the problem sets. Doing homework problems from the textbook can certainly be helpful, but I want to emphasize that these problems are not at the same level of difficulty and complexity as the problem sets! Do not neglect putting in the necessary time on these exercises, or you are not likely to do well on the test.

Study groups: Learning is more enjoyable and more effective when problems are worked collaboratively. Studying and working problems in groups is strongly recommended. Collaboration on problem sets is strongly encouraged.

Midterm exams: There will be three midterm exams (150 points each). Exams will be given during the normal lecture period. Makeup exams will not be given- if you miss an exam, your grade will be calculated using Formula 2. It has been necessary to institute this policy due to abuse of “make-up” exams in the past. However, if you work with the McBurney Resource Center and need alternate accommodations for the exams, please speak with me as soon as possible to make the necessary arrangements.

Re-grade requests: Re-grade request forms can be downloaded from Learn@UW and attached to your exam booklet. These are due the day of the lecture after the exam is handed back. This again will be variable and I will do my best to give you plenty of time to look over your answers, as the TAs and I can and do make mistakes! Please, do not write on your exams after they have been handed back. Exams that have been modified in any way are not eligible for re-grading. We will scan all exams prior to grading. If you plan on changing answers after the exam has been returned, don’t bother to submit a re-grade. You’ll be caught and neither of us will be happy with the outcome (see the Academic Misconduct discussion below).

Final exam: The final exam is currently scheduled for Saturday, December 17, 10:05 am – 12:05 pm. I will announce the location closer to the end of the semester. The final will be cumulative and will be worth 200 points.

Grades: A maximum of 750 points can be earned during the semester. Your final score will be computed using one of the following formulae, depending on which results in the highest numerical value:

Formula 1:	Exam 1	150	Formula 2: Top 2 midterm exam scores:		
	Exam 2	150			300
	Exam 3	150			
	Molecule assign.	25		Molecule assign.	25
	Discussion quizzes	75		Discussion quizzes	75
	Final	200		Final	350
	TOTAL	**750**		**TOTAL**	**750**

Molecule assignment: The molecule assignment basically entails a brief write-up (in either Word or PowerPoint form) about a molecule that you find interesting. The structure of the molecule, a few details about its physical properties, history and uses should be included. Please include references as to your sources- Wikipedia is fine, as long as you include the appropriate citations. Every lecture period, I will choose 2-3 submissions and display them before class for 5 extra credit points. Since I do this in PowerPoint format, students that submit the assignment in this form have a better shot at the extra credit ☺ Examples of previous submissions are available on Learn@UW.

Discussion quizzes: Your TAs will hold four quizzes throughout the semester that will comprise 75 points of your overall grade. These quizzes will be worth 25 points each and the lowest score will be dropped. Quizzes are tentatively scheduled for 9/18, 10/16, 11/13 and 12/11.

Extra credit: The coolest part of being an organic chemist is the chance to develop brand-new reactions and make molecules that have never been made before! Your textbook only discusses well-established chemistry (boring!) and doesn't capture the true excitement of the field. So I always like to give a couple of extra credit assignments where I give you 'hot' articles from the literature to read and ask you to compare and contrast these state-of-the-art chemistries with the reactions you've learned in class. The number and point assignments for these extra credit opportunities are at my discretion and are 'extra' points. In other words, these points are added to your point total and your percentage calculated using [(point total)/750 x 100]. The downside is that if everyone in the class decides to do the extra credit, it won't help your overall position in the course. Fortunately, this is never the case, so the extra credit does help!

For those of you that enjoy a more creative approach, check out:
http://www.chem.ucla.edu/dept/Faculty/garg/Garg_Group/MusicVideo.html
If a group of you would like to make a music video or other video presentation illustrating a concept from class similar to the examples given in the link above, feel free to do so for extra credit. Points will likely be awarded on how clever/funny I find your video ☺

I try to make the molecules that we discuss in class and the ones that you see on problem sets/exams relevant to everyday life, rather than just making up random examples to illustrate concepts. Another way to earn extra credit is to bring to my attention recent articles or examples that describe chemistry related to topics discussed in class. Even better is to make a slide that I can show to the class!

Final grades: Letter grades are not assigned until the end of the course. The number of points you have accumulated through your work during the semester will be the only factor in determining your final grade. I may elect to curve the course, but my willingness to do so will be based on the attitude, participation and hard work of the students in the course. Do not ask me what grade I think you will be getting in the course at any point during the semester. I don't know until all of the final exams have been graded and will simply be annoyed by the fact that you seem to care more about the grade then you do learning the material!

ACADEMIC MISCONDUCT

All scientific fields, including the engineering and health professions, demand strict standards of professional integrity. I have the same expectations for students in my courses and take all instances of academic misconduct very seriously. If the teaching staff and I determine that you have cheated in Chem 345, you will receive an F for the semester, and your case will be recommended to the Dean of Students for further sanction.

Tentative agenda (subject to change depending on the pace at which topics are covered)

Week	Date	Chapter	Lecture material	Assignments
1	Sept 6 Sept 8	Intro/Review/Ch 12 Ch 12	IR Spectroscopy IR/NMR Spectroscopy	
2	Sep 13 Sep 15	Ch 13 Ch 13	NMR Spectroscopy NMR Spectroscopy	PS #1 out
3	Sep 20 Sep 22	Ch 13 Ch 16	NMR Spectroscopy Electrophilic Aromatic Substitution	
4	Sep 27 Sep 29	Ch 16 Ch 17	Electrophilic Aromatic Substitution Allylic and Benzylic Reactivity	PS #1 answers available
5	Oct 4 Oct 6	**MIDTERM EXAM 1** Ch 17/18	**IN LECTURE (Ch. 12, 13, 16)** Allylic and Benzylic Reactivity	PS #2 out
6	Oct 11 Oct 13	Ch 18 Ch 18	Aryl and Vinyl Halides and Phenols Aryl and Vinyl Halides and Phenols	
7	Oct 18 Oct 20	Ch 18 Ch 19	Transition Metal-Catalyzed Reactions Aldehydes and Ketones	PS #2 answers available
8	Oct 25 Oct 27	Ch 19 Ch 20	Aldehydes and Ketones Carboxylic Acids	PS #3 out
9	Nov 1 Nov 3	**MIDTERM EXAM 2** Ch 20/21	**IN LECTURE (Ch. 17-19)** Acids/Carboxylic Acid Derivatives	
10	Nov 8 Nov 10	Ch 21 Ch 22	Carboxylic Acid Derivatives Enols and enolates	PS #3 answers Available PS #4 out
11	Nov 15 Nov 17	Ch 22 Ch 22	Enols and enolates Enols and enolates	
12	Nov 22 Nov 24	Ch 23 **THANKSGIVING**	Amines **NO LECTURE**	
13	Nov 29 Dec 1	Ch 23 **MIDTERM EXAM 3**	Amines **IN LECTURE (Ch. 20, 21, 22, 23)**	PS #4 answers available PS #5 out
14	Dec 6 Dec 8	Ch 28 (15) Ch 28	Pericyclic Reactions- Ch 15 review Pericyclic Reactions	
15	Dec 13 Dec 15	Ch 28 **REVIEW FOR FINAL**	Pericyclic Reactions **REVIEW**	PS #5 answers available
FINAL EXAM: Saturday, December 17, 10:05 am – 12:05 pm				

Strategies for success in this class.

1. **Don't fall behind!** This class asks you to absorb a lot of information at a rapid pace, and each successive chapter builds upon principles in the previous chapters. Cramming just doesn't work in this class. Instead, you should set aside a little time every day (30 minutes or so) to study and keep caught up. I will say this over and over again- memorization is NOT the way to do well in organic chemistry. There are instructors who will teach in this fashion, but I am not one of them. However, if you work at understanding the key principles governing reactivity, it won't matter what molecule I give you or what functional groups are present- you'll understand the rules and be able to readily solve problems that you have not seen before in either lecture or in your textbook.

2. **Practice, practice, practice.** <u>This is the most important key to success in this course</u>.

   It's a truism among endurance athletes that you train for the event that you're racing. That is, you can't train for a marathon without running, and you'll never win a bike race if you don't ever climb on the bike. The same is true of your classes. In this course, the exams that make up the majority of the points you earn ask you to solve problems. Therefore, you should train for exams by working problems, and the more problems you do the better off you are. This is why I ask you to do so many problems, between the problem sets and the suggested problems from the book. Louden is a great textbook, and one of the reasons we selected it is the quality of the problems at the end of each chapter. I have also put last year's textbook (Solomons) on reserve in the Chemistry library, which is also a good source of problems.

3. **Read the book.** Each unit has more information than I can reasonably cover in lecture. The textbook is your primary source of information, and any information in the assigned reading is fair game for exams. I strongly suggest reading the chapter twice – once before the corresponding lectures, so that you can follow the key points in the lecture, and then once again afterwards, so that all of the details have a chance to sink in. Work the in-text problems as you go. I'm not about memorization, but you will need to understand key concepts and patterns of reactivity or you will struggle in my course.

4. **Come to lecture and discussion sections.** The purpose of lecture is to highlight the most important material in each unit, to help you organize the information in a way that's logical and easy to remember, and to show how certain important themes run throughout the entire course. From a completely GPA-centric point of view, it makes sense to come to lecture because it helps identify what I think is most important to know, which is likely also to be what I focus on when writing exams. It's also your best opportunity to ask me questions about the material and the structure of the course. The discussion sections are designed to go into more practical detail about the content of the lecture. Your TAs have a good idea of what is expected to do well in the course and will push you at the level that is necessary to succeed.

5. **Take good notes and copy them over.** The key to managing all of this information is to organize it well in your head. The book presents the material in a way that makes sense to the author; I'll present it in a way that makes sense to me. But your brain is likely to work in a different way. It's a really good idea to take notes on your reading, take notes in lecture, and re-organize them into a master set of notes that works for you.

6. **Study in groups.** Studying with your friends makes studying seem less like a chore and more like a social occasion, and it'll help you keep up with the class. It's also a great way to identify the material that's the trickiest to grasp, so that you can ask better questions during lectures and office hours.