

Chem 343-5

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Office hours: Mon. 3:30 PM, Tues. 6:30 PM, Thurs. 2:25 PM

The slightly unorthodox office hours in the evening are due to role as assistant lab director for the Chem 344 lab course. I supervise the evening lab sections and am happy to hold office hours in the evening which may work better for some of your schedules.

TA Office Hours

Matt Aronoff, maronoff@chem.wisc.edu, Office Hours: Mon 12:05 PM, Thurs. 11:00 AM

Will Tucker, wtucker@chem.wisc.edu, Office Hours: Mon 8:50 AM, Tues. 5:40 PM

Ellen Valkevich, evalkevich@chem.wisc.edu, Office Hours: Mon 9:55 AM, Fri. 8:50 AM

You are encouraged to take advantage of as many office hour visits as you need. Feel free to pick an office hour that fits with your schedule. All of the organic TAs should be able to help you effectively.

Chemistry 343 Grading*

There are 600 points available in this course. There are four 25 pt quizzes, three 100 pt exams, and one 200 point final. No points will be awarded for the problem sets or attending class. No exams or quizzes will be dropped; you must take them all at the regularly scheduled time unless you have a university course conflict. All points have equal value. The final letter grades based upon 600 course points will reflect the historic averages of Chem 343 with a course GPA near 2.74.

25 pts. Quiz 1 Discussion

100 pts. Exam 1

25 pts. Quiz 2 Discussion

100 pts. Exam 2

25 pts. Quiz 3 Discussion

100 pts. Exam 3

25 pts. Quiz 4 Discussion

200 pts. Final Exam

There are NO makeup quizzes. You must attend discussion on the dates of the quizzes.

*Subject to change.

Folks, please don't cheat. Cheating is bad; cheating is sad.

Dealing with academic misconduct is the most painful/sad/annoying part of my job. Historically in Chem 343/345, penalties have ranged from a zero on the related-work and a letter on file with the Dean of Students office to failure/removal from the course with larger UW Dean's office penalties. Ben and I had to deal with two cases of academic misconduct last semester and it was pretty unpleasant and heartbreaking all around. Out of respect, for yourselves, each other, and your instructors please behave in an appropriate manner with regards to all of the assessments.

[UW Dean of Students Office - Academic Integrity](#)

From my experience, the two most common forms of academic misconduct in this course are related to re-grades and sharing information about quizzes/exams. Here are some general thoughts and suggestions on the topic... (no particular organization or forethought)

- 1) Do not talk to people about the quiz if they haven't taken the quiz.
- 2) Do not turn in work or thoughts that aren't your own.
- 3) Looking at someone else's exam or notes you brought in or whatever is bad, very bad.
- 4) If it feels like you might be doing something icky and dishonest; you may well be, try doing something else instead.
- 5) Do not change your answers on your exam and ask for a re-grade. You might think I'm stupid and I might be... but I'm not that stupid.

6) When you come to the exam or quiz, sit far enough away from anyone else and in a posture that no proctor can think you are cheating. Make sure all of your stuff is in airplane mode, like your phones, computers, purses, backpacks, etc... If all your stuff is put away, shut down, zipped up, and not connected to the internet, so no one can think you're trying to cheat.

7) In the words of one of your classmates from a previous semester about sharing exam related information, "It wouldn't be moral and since this class is curved, revealing knowledge of the exam wouldn't be beneficial to my grade either."

8) Cheating to gain a few points is not worth the possible repercussions. I'm sure of it. I've checked.

Materials

Required:

Organic Chemistry 5th edition by Marc Loudon

Recommended:

Solution Manual Organic Chemistry 5th edition

(Additional solutions not in the Solution Manual are posted on Learn@UW)

Molecular Model Kit

Several model kits are available online, at the UW Bookstore, and from AXΣ in the Mills Street Atrium of the Chemistry Building. It is not important which model kit you acquire, none of them are perfect and all are helpful. (I like one of the more expensive one simply for the nice snap/pop sound it makes when in use.)

ChemDraw ([ChemDraw 13 Download Instructions](#))

As a UW student, you get ChemDraw free! This is pretty awesome! I highly recommend downloading the software and using it whenever you are sending an email question to a classmate, myself, or a TA. It is the same software that we use to draw all of the molecules for your problem sets, quizzes, and exams.

Where the Learning Happens

Philosophy

To quote one of my best teachers, "All real learnin' is painful." He was a football coach which might have shaped his outlook on teaching and learning chemistry. Over the years, however, I have found a lot of truth in his statement. In challenging learning environments or courses that have high expectations, mastery of the material has required a lot of effort, a lot of toil, a lot of time and a fair amount of pain. Learning is not free and sadly is not available Matrix-style. To move from familiarity to understanding and mastery, in organic chemistry, is going to require a great deal of focus and effort. I promise that by the end of chemistry 343/344/345, you will be a more mature learner, a stronger thinker, and have a much better understanding of chemistry.

Each phase of learning below is important for your success. Do not overlook any of them.

Lecture

The purpose of lecture is to provide a conceptual framework for you to understand the course material. Key concepts and examples will be highlighted. While many details will be discussed, the focus will be on the big concepts and how the current material connects to past learning and future expectations. Lectures will help define the depth and breadth of the course and will help you understand the course expectations. I will try to always be available in the lecture hall before and after lecture for questions.

Discussion

The discussion sections with your TA are critical as part of your learning process. The discussions play many roles all of which serve to deepen your understanding of the course material. You will have a chance to talk to your TA about problem solving strategies, difficult course concepts, and address common misconceptions. Discussion provides a great opportunity to talk about the material. You will learn a lot more if you are engaged in conversations about course content than if your only studying is hiding in cage in depths of the Memorial Library Stacks. Furthermore, your TA's are highly successful organic chemists. This means that they can point out common issues that students struggle with and help you avoid them. They can provide you with learning insights that worked for them and they can help you interpret the textbook and lecture materials in a fairly sophisticated manner. Get the most out of it by showing up, ready to discuss the week's material.

(Plus, Matt, Will, and Ellen are pretty cool people that you should get to know. Sometime ask them about their research...)

Office Hours

Your TAs and I are highly concerned about your learning. Unfortunately, there are 340+ of you and we can't reach out to each of you individually and make sure that you are having the success that you are looking for. That's where the office hours come in. In the past, the most successful

students took good advantage of office hours on a weekly basis. They came with lists of questions and clearly identified problems that they needed help solving. This led to great discussions and a very effective use of time.

Your TAs will be holding office hours and you are highly encouraged to attend and get some one-on-one and small group help with the problem sets and previous exams. Additionally, the Organic Chem TA office that will be staffed most of the day with TAs of Chem 341/342/343/344/345/346 ready to answer your questions. Feel free to go as often as you like.

Email

You are welcome to ask for assistance via email to your TAs and myself. Please remember to be very clear when wording your questions via email. Pictures of structures from your phone, scanner, or ChemDraw are very helpful. Try to avoid asking email questions that are readily available on Learn@UW, but please do email questions of clarification or to address an area of confusion. We are all very busy, so please be patient. We will respond as quickly as possible.

Problem Sets, Textbook, Previous Exams

The only way to make sure you are learning at the right depth and pace is to complete the practice problems available. If you cannot transfer what you know to new molecules or new structures, it identifies a gap in your knowledge and understanding. Answer keys are provided to the problem sets and textbook, use these to check your learning. Answer keys are intentionally not provided to the previous exams. This is done to encourage you to talk to your classmates and instructors about any answers that you are unsure of and to work through problems that you can't simply look up the answer to and shortcut the thinking/learning process.

Classmates

Nothing reveals your misconceptions and misunderstandings regarding organic chemistry than trying to explain something in words. If you are working with one or more classmates on a regular basis, both of you will benefit from the opportunity to talk about organic chemistry. Helping others through material is a great way to take your own learning of a concept from superficial to mastery.

Additionally, there are plenty of other resources from the UW-PLA, free tutoring options, and paid tutoring options. Most importantly, find a way to master the material and have success.

Tips for Success in Organic Chemistry

I polled the top 10 students from Chem 343/345 in the 2012/2013 academic year and asked them to provide their advice for how to succeed in organic chemistry. Here are their un-filtered responses. I hope that you can use their tips and suggestions to improve your chances for success in this and other courses. I've ordered them from the shortest to the most verbose. You

will see that their methods varied slightly by their advice. They are in agreement, however, on how much commitment and effort these courses require.

Student 1:

I don't actually have any special strategies other than just listening in class, taking notes, and doing the problem sets. I don't think it's much help.

Student 2:

I had success in this course by focusing almost entirely on the problem sets and lecture notes. I only used the book when I had a hard time grasping an essential concept. I also tried to learn why every reaction from the problem sets happened and didn't memorize a reaction unless we did not learn the mechanism. I think most of my success came from doing the problem sets right after the material was learned in lecture rather than right before the test. I found that the harder concepts were more easily grasped by doing this.

Student 3:

- 1) Doing every problem set to full understanding - meaning not just copying your notes but actually knowing what is happening in each question.
- 2) Knowing why instead of what - I feel like a lot of my friends that took the class simply tried to memorize every reaction and what the product would be. Based on what other people told me prior to taking the class I'd gather they had the same process. However I think that knowing why each reaction takes place makes the class 100000 times easier. It takes almost all the memorization out of it and turns it into knowing a few simple concepts that apply to nearly all the mechanisms.

Student 4:

I worked on organic chemistry every day for at least an hour. Most of my studying was independent, but occasionally I studied with a few other students and attended office hours when needed (which were always helpful). The textbook was helpful for some of the reaction-heavy chapters, but otherwise not very useful. The problem sets are a great indicator of the format and style of quizzes and exams, and understanding those is most important. Additionally, lecture notes are great for reviewing concepts. The key to success in organic chemistry is understanding how and why things occur, rather than mere memorization. I found it very helpful to formulate a study guide containing all of the reactions, mechanisms, and notes pertaining to key ideas.

Student 5:

My first piece of advice to organic chemistry students is to take the quizzes seriously. They provide a great opportunity to see if you really know the material before taking the exams. Additionally, if you really take them seriously, they force you to study the material early on instead of cramming the night before the exams. My second piece of advice is to really focus on the problem sets as they give a good indication of what will be on the quizzes and

exams. Instead of waiting for the answer key to be posted, try to complete as much of the problem set as you can. Finally, I advise you to make flash cards. Even if you never use them to review before the final, just writing the reactions provides additional practice. Good luck!

Student 6:

The best advice I can give is read the assigned text along with each lecture, take good notes during lectures/discussions, do the practice problems after reading the chapter, follow this up by doing as much of the problem set as you can, look over the answers to the problem set to try to work out the ones you get wrong, ask lots of questions when you have them, attend office hours (not many people go and this is where you can learn A LOT!), make note cards and most of all, try to enjoy it!

Student 7:

1. It's not as scary as everyone makes it out to be. Don't freak out.
2. It's not a class for which you can expect to memorize all the information in the class and succeed. Yes, you have to memorize a lot of reaction conditions, but that's not the key to the class. The key to success is understanding why/how things happen, at least the reactions that we have mechanisms or theories for. Once you understand why things happen, the memorization is either much easier or not necessary at all. I had a lot of friends who'd ask me what the product of a reaction was, expecting me to be able to just pull the answer out of my head. I would just draw out the mechanism based on the reactivities we had learned, and that would be how I would get the final answer, instead of trying to just remember it. Understanding the why and how is important for reactions, and is more so for understanding the exceptions to reactions that are generally tricky to memorize. So I would say that my main advice is to learn and understand the coursework before trying to commit it to memory, or else the class will be just as hard as everyone says.

Student 8:

Although the lecture notes are placed online, I don't think it is a substitute for the information you get from attending lecture because everything comes together when you hear the explanations. I would rewrite the lecture and discussion material, as well as the explanations for each, on flashcards. By the end of a unit I would have a considerable pile of flashcards which were used as a study guide for the exams as well as the final. I would go through my flashcards until I could explain, draw, or write out everything on the backside of each card without looking at it. I personally think being able to explain why each problem or reaction happens is so vital to doing well in the class. Although it may seem more time consuming, I think it actually saves you time in the long run and makes the class easier to tackle by understanding rather than memorizing. Prior to an exam or quiz I would also thoroughly do the problem sets multiple times until I understood/can explain everything on them. With doing all of this, I probably spent 4-7 days a week studying chemistry. I didn't really utilize office hours or other resources like PLA because they conflicted with my other classes; however, personally I was able to find sufficient clarification from the book or from lecture. At the beginning of the semester I attempted to

persevere through each chapter in the textbook but I found it to not be necessary. Later in the semester, I just referenced the textbook to clarify concepts I didn't understand and then transferred portions onto flashcards as needed.

Student 9:

On average I would say I spent around 3 days per week on organic chemistry, and generally it would be a day reading through the textbook, another day doing the given problem set for that week. The final day was for either finishing the problem set or doing other problems in the textbook. I did almost all of my work alone, but at times I felt it would've been beneficial to work in groups if the topics were more difficult because then discussion could've produced a better understanding of the material. I also never attended office hours, but I attended all of the discussion sections and had my questions answered during that time.

My study plan for each chapter was to first read through the textbook, and this was usually after we had completed most of the chapter in lecture, so the textbook was used as a review of the lecture material. Then, I would complete the problem sets after the lecture notes and reading through the textbook. To study for quizzes and exams, I would review the lecture notes and redo the problem sets to prepare. I also found it very useful to make note cards because making the note cards was a good review of the material and they worked great for reviewing for the exams.

The thing I found to be most helpful to having success in both 343 and 345 was learning the material in such a way that I could apply trends and the chemistry in different situations instead of attempting to memorize the chemistry. Organic Chemistry is a lot of information and there is no way any student could memorize and retain all of the material involved. I learned that to have success you really needed to know the chemistry and be able to apply it to different situations. The problem sets and the textbook really helped me actually understand the material and from that I could apply it to problems that involved different situations.

One thing you hear a lot before you take O-Chem is how hard it is and how much work it is. One thing I wish I knew before is that the hard work definitely pays off in the end, and if you do put in the work you learn a lot, and for me it became one of my favorite courses.

Student 10:

During the spring semester I would generally spend 4-6 days on organic chem, on some days I would spend as much as 4 hours and others as little as 30 minutes. But this includes time spent on my 344 class. If I had been just taking 345 I would definitely have had to spend much less time on organic. I generally worked and studied by myself. Whenever I had questions or was unclear about a topic I would go to Ben or ask Brian. I would read the textbook for each chapter, and have read most of the book. I feel that reading the textbook was helpful because it generally would go into detail explaining why certain things would happen. At times the text would seem a bit irrelevant, in relation to the course material, but having the in-depth knowledge definitely helped. Before exams and quizzes I would focus heavily on the problem sets, while glancing over the lecture notes and my textbook notes.

I definitely feel that the teaching style played a big part in my success. As I mentioned previously, learning why things happen and the reasoning behind chemistry is superior to learning *what* happens. The course is taught with this in mind, and did a great job explaining the theoretical aspect of many reactions. And in particular, I found how the course related different reactions to already understood reactions and concepts extremely helpful. For example, when you would demonstrate how some newly learned reactions were analogous to previous reactions, and how you related reactivity trends to stuff learned in 343 (sn2 rates, chem eq, etc). Also, it seemed to me that much of 344 dealt with acid-base eq, which seems to never go away and is definitely worth knowing. If I were to do it again I would focus a little more on the lecture notes when studying.

Student 11:

Success in organic chemistry involves understanding concepts, considerable practice, and operating under the assumption that mastering the material is going to be time-consuming. With these basic axioms, one can succinctly approach the content without getting entirely overwhelmed—so long as adequate time is allotted.

I usually begin ‘studying’ by thoroughly reviewing lecture material. This first step hinges on taking comprehensive notes during lecture; this means you should be present and prepared to really engage your mind. Drink coffee if you have to. Using notes, I try to understand the underlying concepts and key points, not merely memorizing definitions and reactions. I found it helpful to go through my lecture notes and annotate them, like: *this happens because..., *important because..., etc. Additionally, I’d occasionally make in depth note sheets that synthesize key points/topics/reactions, also pulling useful material from the corresponding book chapter. Although I generally view textbooks as the bane of enjoyable learning, sometimes the book presents content in a manner that is more conducive to understanding or it clarifies a confusing topic—use it as a resource, albeit a dull one. In conjunction with note sheets, I’d re-transfer important information/reactions/definitions to flash cards so I could quiz myself. It’s a tough life, being a nerd.

Once I was confident in my understanding, I would apply this knowledge to practice problems. Generally I’d begin with book problems, as they are simple and integrated within the text, and move into the more complex problem sets. I found it extremely useful to complete a whole set of problems (ex. a chapter in the book or an entire problem set), then immediately correct my own work. This was my way of identifying what I didn’t understand and what I needed to practice more, so that when I did round two of practice problems I knew which problems to focus on. I spoiled it in the last sentence, but my penultimate step is to redo practice problems. By this time, if you can’t do nearly all of the problems correctly without notes, cycle back to step one. Study, practice, repeat. Drink more coffee, if you must. Lastly, keep up with the material. Week-by-week, chapter-by-chapter, make sure to stay current with the content. Disregard my process if it doesn’t suit you, but absolutely do not fall behind. If you are ready to devote a lot of time to this course and make it a priority, you can succeed without struggle. Embrace your inner nerd and nearest caffeine source, and get ready for a real good time.

Student 12:

The days per week that I worked on organic varied with what was covered and what else was happening that week. On average, I studied about 30-40 hours/week studying. The time spent on learning the material significantly increased over the semester, so at the beginning probably only 20 or even 15 hours/week. This being said, I would advise students to take a light credit load if they can, especially if it is taken at the same time as biology 152, as is the case for myself and many pre-health students. I took 13 credits, my other classes being Immunology and a 2 credit Undergraduate Research Scholars seminar and lab project (this also double dipped with the biology 152 lab research project).

I mostly worked on my own to learn the material, and then reviewed before exams with others. I often get distracted around others, and end up not really learning anything. If any parts were confusing or if I had conflicting notes, I wrote down specific questions as I came up with them, so that I wouldn't forget them. Often times, the next day or lecture I would be able to answer them myself, but for the ones I did not, I would ask a friend or go to office hours. Note on office hours: go in with specific questions, because the sessions are often crowded and they will be more useful and efficient to you if you have direct questions that are easily answerable. If the session is really crowded, don't be afraid to ask other people who are waiting to ask their questions, they may have the answer or maybe the same question. If they ask you a question, it's an opportunity to test your knowledge and teach it (this is also great in review study groups) or if you can't answer it, it may be a question worth thinking about too.

Textbooks: READ. They are practically another version of the lectures, but in a different enough way that it offers different ways of looking at the material. Also, lectures go so fast sometimes that the entire lecture seems like a blur of information and notes are confusing, so reading is key. After reading a chapter, I went back and did the problems in the text to test the material again (*****testing yourself over and over again at every stage of learning and seeing what's wrong/right and UNDERSTANDING WHY it's wrong/right, is pretty much the most important thing to take from my long explanations*****). From the problems at the end of the chapter, I did the synthesis ones and the ones that are similar to exam/problem sets, but doing them ALL is ridiculous and often confused me more. For the time I spent on them, I didn't get much from them, so I stopped doing most of them the second half of the semester when my grade in the class went from a little over average to a lot higher.

Problem Sets: GOLD FOR REVIEWING FOR EXAMS!!! So much material and examples are covered in the problem sets that are not mentioned during lectures and are very likely to appear either identically or almost identically on the exams. For the final, I actually printed out the ones from earlier in the semester and did them again. I also like using them as practice exams, since my semester didn't have any. Do them to the best of ability while circling ones unsure about, return to the circled ones with hints to remind you, then grade yourself on the whole problem set to see how you did and list questions/inconsistencies for office hours or study groups. This is a good way to see where you're not quite understanding something.

What I found probably the most helpful, that I started last minute before the second exam, but wish I had began when the course began or in 343, was to make a Book of Organic Chemistry. This includes EVERY SINGLE REACTION GIVEN IN LECTURE AND DISCUSSION!! Each sheet of paper = 1 reaction + the mechanism + any miscellaneous notes regarding the reaction,

it's conditions, products, etc. It sounds time consuming, but it's not because instead of practicing a million reactions on scratch paper and then throwing them away after the exam, make at least one nice copy, be sure that everything on there is accurate (I suggest writing in pencil), and save it (it's really cool to see how thick the book gets during the semester, plus it's a little more engaging than reading notes or doing the problem sets again). **They are amazing for the final!!! By the end, I had a 121 page reference book of all of the reactions, mechanisms, and important notes, and I even consolidated a few similar reactions that did not have mechanisms on one page. The overall reaction and reaction name goes across the top, and then the mechanism below that, and a box for notes wherever it fits on the page. With this layout, you can cover the bottom and left to make flashcards for products, or just cover the bottom to test knowledge of the mechanism. Also, don't forget a table of contents, makes looking up reactions go a lot faster.

Good advice that I was given: Think like a professor.