

ORGANIZATIONAL BLURB FOR CHEMISTRY CHEM-UA 227

“Problem-Solving” Organic Chemistry, Fall, 2016  
Weinstein CL Room, 11 University Place, Tu, W, Th, 3:30-4:45

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Undergrad Teachers

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**General Course Description:** For the first week, this course will operate in the traditional lecture format. We will use that week not only to cover some material, but also to organize the small groups that will spend the rest of the semester working problems. There will be some other lectures in the Fall, but the bulk of the time will be spent working those problems. We will construct the groups, but you may “self-assemble” by selecting one working partner. However, that partner also has to select you, and both of you must email MJ! No more than pairs, please.

Our goal is not to transmit facts to you. Facts will inevitably be forgotten, and have an uncomfortable way of changing with time. Instead, we will focus on learning how to “think organic chemistry,” on how to become a good problem solver. The first semester of this course will cover structure, bonding, spectroscopy, and the fundamental building block reactions of organic chemistry: substitution, elimination, and addition reactions. We will cover approximately 12 chapters, 1-12. There is a schedule posted, but keep in mind that the details are certain to change as we go along.

Our aim is to teach the best course in organic chemistry anywhere. Although we may – or may not – fall short of this goal, it will not be for lack of effort. In turn, this version of the organic course demands much of you. For you to succeed in this course, for you to learn how to be that good problem solver, and for you to do well, you must participate actively in the problem-solving sessions. You cannot sit passively and absorb information. You must – *must* – be willing to put your ideas out for discussion – and some of those ideas will inevitably be wrong. That’s how real science gets done – necessarily imperfect ideas are discussed, argued over, and refined to better approximations. After all too many years of experimenting at Princeton, NYU, and elsewhere, I am convinced that the small-group method works, and is far superior to the traditional talking-head lecture method. But this method is not for everyone; you must participate.

You must always go to class and you must keep up with the reading. Think carefully – are you willing to do those things? If you are, this course will work. If not, we warn you that it will not.

**Details of the Format:** We will start the first week with traditional lectures, but this delay is only to allow us time to form the groups. Lectures will rapidly fade away and

become even less frequent in the second semester. The class will be divided into groups of four and these groups will work a set of problems together each day. Finished problems and answers will be posted on the course Classes site as they are done. We will cruise the room, helping to keep you on track, responding to questions, and making suggestions for different approaches and/or extensions. Attendance at the problem sessions is essentially mandatory. We won't officially penalize you, but there is a very strong inverse correlation between the number of missed sessions and grades. Come to class - that correlation is very strong. History says that every missed problem session "costs" you about 2-3 points on your final average – *that's a lot*.

**Texts:** The texts will be "Organic Chemistry, Fifth Edition," Maitland Jones, Jr., and Steven A. Fleming, W.W. Norton, New York, and the Study Guide, also published by Norton, by Jones, H. L. Gingrich and Fleming. The Study Guide has elaborate answers to all the problems in the book, and is utterly essential. Norton offers a package deal in which the Study Guide is essentially free. The books are available at the bookstore and elsewhere. No, you cannot effectively use earlier editions of this book because much has been changed in going from the Fourth to Fifth Editions. The CD that comes with the book has computer-generated animations of many reactions, and has been used as a source of exam problems. You need it. The text and lectures are separate parts of the course. There will be material covered at length in the book that we do not touch on in lecture, and vice versa. The Classes site will have general chapter listings, but these are meant to be neither inclusive nor exclusive. You are expected to forage widely in your readings, using the index as well as other texts. We can recommend Marc Loudon's fine book, "Organic Chemistry, Fourth Edition," Oxford, as a book that can be profitably consulted for another view on things.

**Models:** You need a set of Molecular Models. We suggest the Maruzen Models, and the Bookstore will have them.

Another possibility is Darling Models available through the www:

<http://www.darlingmodels.com/>

If you can spend a bit more, better Framework Molecular Models are available though Amazon at about \$46. One set could easily be used by two people.

**Classes Site:** Here you will find suggested problems for each chapter, old and current exams and answers, readings, assorted handouts and announcements, and, sometimes, Opportunities for additional Exam points. Check it often.

**Problem Sets:** The Classes site has suggested problems for every chapter. Unfortunately, we do not have the manpower to grade these, so they are not required. However, you will find that doing problems is vital in preparing for exams. You are urged in the strongest terms to do those problems and to do them without the aide of the

Study Guide. The effectiveness of working problems drops precipitously if you do not do them first without the Study Guide. There will probably be too many problems in the book for you to do them all, especially as the semester proceeds and demands on your time increase. One obvious solution is to do only some of the problems. That technique seems easy, but many people are intimidated by this simple idea and just abandon the problems until panic time. There is nothing wrong with doing every other problem! The best way to do the problems is to do them with your group, with each member of the group having the task of doing one or two problems and then explaining it to the group. If you adopt this method, you will find that the “explaining” part is an extraordinarily effective way to learn. The problem sets, especially the later ones, do not contain “drill” problems. Such exercises are common in the book, however. It is very important that you be in control of the basic parts of the course before you attempt the “think” problems on the problem sets or on the exams.

**Exams:** We have been assigned dates on which we can give exams (see Schedule). We have exactly zero control of the exam dates, and they are often very sub-optimal. We don't like that any more than you do. On all exams except the Final you will be given 2 hours. We promise that the extra time is not to allow us to write extra-long exams. Problems in organic chemistry tend to respond to contemplation, not “blitzthought.” The hope is that this system will allow those who, like us, work slowly, to relax during exams. There is no reason to take all the time if you are done. Leave when you are done. Resist the temptation to over – analyze. Thinking “simple” is usually the right thing to do. As Ted Williams once said, “If you don't think too good, don't think too much.” Please note that all exams are cumulative. Recent material may be emphasized, but you are responsible for all the material covered so far. You may drop the lowest of the three exams - see the section on grading. Sample exams and answers from the last two years are posted.

**Regrades.** Every so often we make an error. Usually it is technical - an example would be points awarded inside the exam but not properly transferred to the cover. Sometimes we make an error in interpretation or miss something you have written. If, after the answers have been posted, and *after you have looked at your exam*, you feel strongly that an error has been made, the procedure is to hand the exam back to MJ with the posted regrade form.

Two things: 1. Do not hand in a regrade for 1-2 points unless the issue is technical. That amount is within the noise on any exam that asks “think” questions. 2. If you hand the exam in, you are handing in the whole exam. Points may come off as well as be put on. **Important:** About 75-80% of grading errors are made in your favor. To be frank, handing in a small regrade is rarely worth it. But if you are sure, by all means do so.

**Quizzes:** Starting with week three, there will be a 15-20 minute quiz, usually at the start of the Thursday class. These will be graded and we will drop your lowest two. Sick? Lost? Relaxin' on the beach? Those are drop days for you – do not bug us with pleas for exceptions – we are dropping two, after all!

**ChemDraw:** ChemDraw is the standard structure-drawing program in organic chemistry. NYU has a site license for this program, which you should download from:

<http://sitelicense.cambridgesoft.com/sitelicense.cfm?sid=991>

You can use the Chem3D program to analyze different conformations of organic molecules.

**Grades, Grading Schemes, Psychopathology, and Competition:** At almost every school, the course in organic chemistry has the reputation of being very hard and, often, destructively competitive. Moreover, it is widely held that success in “orgo” is essential to gaining entrance to The Medical School Of Your Choice. We can do nothing about the last notion, as it is utterly external to our efforts here. **Most Important:** In this course, you are not in competition with your neighbor. What he or she gets has NO-repeat: NO - bearing on your grade. There is NO curve, which simply means two things: 1. There is no pre-set number or percentage of A’s, B’s and so on. There can be a year in which everyone gets an A. 2. Exams will not be scaled to some pre-set number. We aim for a median of about 65 on all exams. Historically, 65 has been *roughly* the B – B minus divide, and in the Fall semester, about 65% of the students get A’s and B’s (so, the course is not that hard). There are two methods of calculating your score. You will get the better of the two possibilities. 1. We drop the lowest score on the uncurved three in-term exams. The average of the remaining two counts 60%. The Final counts 30%, and the quiz grade counts 10%. 2. We count all three exam grades. The exam average counts 65%. The Final counts 25%, and the quiz grade counts 10%. Regardless of the option you use, your overall grade is made up of 75% course grade and 25% lab grade.

**IMPORTANT:** You must pass both parts of the course. An F or D in the lab will not be rescued by a higher grade in the course part, and *vice versa*.

We are going to supply some rough historical grade cutoffs. Please read the following information carefully.

**WATCH OUT!** These numbers are rough and refer to the *course* part of the grade – this year the lab will be factored into the overall grade.

ROUGH historical grade cutoffs for the Fall: *Nota bene:* There is a price to this information. Cutoff lines are drawn where there are breaks, not at arbitrary scores. Those breaks vary a bit from year to year. DO NOT - repeat: DO NOT! - send me an email that says something like, “You said the cutoff for an A was about 81 and I got a 81.0001 and therefore I demand a grade change.” Note also that there is always some subjectivity about grades on or close to a line. A student who improves with every exam and winds up just below a cut is likely to get boosted. A student who declines throughout the semester is not.

Finally please do not ask me, after the course is over, if you can do "extra work" to raise your grade. You can't.

Lowest A about 81-82  
Lowest A minus high seventies  
Lowest B plus 72-73  
Lowest B about 65  
Lowest B minus about 61  
Lowest C about 46-47  
Lowest D about 40