

CHEM 345: Intermediate Organic Chemistry

Contact Information

Matt (Doc) Bowman
262-2519

Chemistry 5232

bowman@chem.wisc.edu

**3 credits: Lecture 50 min three times per week
Discussion 50 min once per week**

Lecture 1:

MWF 9:55-10:45 AM

Room: Chemistry 1361

Office Hours

Mondays and Wednesdays 12:00-1:15 PM Chem 1371

Mondays and Wednesdays 3:30-5:30 PM Chamberlin 2135

(or by appointment)

Teaching Assistants

Jordan Ho

jordanho@chem.wisc.edu

Mingxue Huang

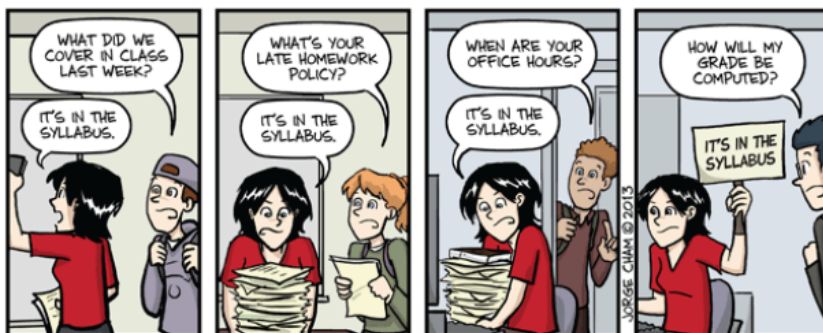
mhuang@chem.wisc.edu

Nicholas Walters

nwalters@wisc.edu

Piled Higher and Deeper by Jorge Cham

www.phdcomics.com



IT'S IN THE SYLLABUS

This message brought to you by every instructor that ever lived.

WWW.PHDCOMICS.COM

title: "It's in the syllabus" - originally published 5/10/2013

TA Office Hours

TA office hours on the day following exams will be cancelled as the TA's will be grading then.

TA office hours are held in Chemistry B317 (Organic TA Office)

Jordan Ho

Tuesday and Thursday 8:50-9:40 am and Friday 3:30-4:20 pm

Mingxue Huang

Thursday 8:50-9:40 am, 12:05-12:55 pm, 1:20-2:10 pm

Nick Walters

Tuesday 12:05-12:55 pm, 1:20-2:10 pm, Thursday 12:05-12:55 pm

Matt's Schedule:

Matt Bowman this fall is lecturing for two courses Chem 341 and Chem 345. There are 110 students in 341 and 255 students in 345. Matt will try to keep everything straight, but will not remember necessarily which student is in which lecture. Because he has to split his mind to deal with each class, he might not be completely there. There will be weeks in which there will be an exam happening for both classes. At which point, any vestiges of his sanity will disappear and there will be drool, *lots and lots of drool*. (His sanity is not being helped much right now as Matt Bowman is writing in the third person). Please state in any email correspondence with him whether you are in 341 or 345. The answer to your questions may differ significantly. Please be patient. If he does not respond within 12 hours, try again.

Also, he does have a hand in at least one laboratory course (Chem 342) so again please be patient.

Also, the 341 lecture is directly after 345 lecture, so when the bell rings, he will be leaving the lecture hall for the next class. His refusal to take questions after class is due to time constraints and not rudeness. Well, 90% time constraints and 10% rudeness, or more likely a 60:40 mix. Point is: ask questions before and ***during*** class.

Textbook: *Organic Chemistry*, 6th Ed., Loudon and Parise

Quite a few of my course evaluations in the past stated that they never read or opened the book. I do not recommend this course of action, but I do understand it. I follow a different order than the textbook, but a majority of the material from Chapters 12-13,16-27, and some reactions and concepts outside the book will be covered. The course schedule has page numbers containing relevant information from the text along with key words that you can use in an index of any organic textbook for other explanations. Copies of the textbook are on reserve in the chemistry library for you to read. Instructors of Chem 344 may expect you to have this textbook for that lab course as well. Exams and quizzes are based on the material from lectures, power point tutorials, video lectures, discussion sections, and problem sets. The book is there to provide alternative explanations/approaches to help you understand the material covered.

Video lectures

Learn@UW will host a variety of video lectures. These are typically 5-10 minutes long. They are there to highlight important concepts or clarify points in organic chemistry. I am told that the VLC media player works quite well with these videos if they are downloaded first.

Problem sets

There will be a problem set for each lecture day except for the day of an exam or the day preceding an exam. These problem sets will not be graded and are there to help you out. Keys will be available by the next lecture day on Learn@UW.

Practice exams

I will make at least three practice exams available for each exam. The exams will be very similar to the practice exams in terms of directions. Answer keys for these exams will also be available. **DO NOT SIMPLY LOOK AT THE KEY. ATTEMPT THE PRACTICE EXAM FIRST. HAVE ANOTHER STUDENT IN THE CLASS GRADE IT AS YOU GRADE THEIRS. DISCUSS DISCREPANCIES AND ONLY THEN LOOK AT THE KEY.** Also, there will time to time be errors on the key. Please let Matt know.

Exams:

There are four regular exams plus the final exam. Each regular exam will be worth 100 points. The regular exams will be Monday evening exams held from 7:15 to 8:45 pm in a lecture hall to be posted on learn@UW on a handout called Exam Information Sheet. Please check your schedules for potential conflicts. The dates are September 21, October 12, November 2, and November 23. Please notify me **ASAP by email** of any conflicts so alternative arrangements can be made. **Notifying me the week of an exam is NOT ADVISABLE as I will be cranky.**

You may not drop any exam.

The final exam is worth 200 points and cannot be dropped. It will take place on Monday, December 21 from **7:45 am to 9:45 am**. Unfortunately, this date is set by the University and I can only grant makeup exams in a VERY limited manner such as two exams within a 24 hour period. Please do not ask for a makeup exam due to airline tickets going home for winter break. I'm afraid that is not listed as a valid reason.

Exams will be graded and returned at the next lecture. **PLEASE, PLEASE, PLEASE PICK THEM UP. LOOK AT THEM. MAKE SURE THE SCORES WERE ENTERED CORRECTLY AND THAT YOU UNDERSTAND WHAT YOU MISSED.**

Exam regrade policy: Mistakes in exam grading will occasionally be made. You will have one week after exams are returned to submit the entire exam for regrading. Keep in mind, since mistakes may or may not be in your favor, the exam grade can actually be lowered. All decisions on the regrades are final. **DO NOT UNDER ANY CIRCUMSTANCES CHANGE AN ANSWER AND SUBMIT IT FOR A REGRADE. THIS IS ACADEMIC MISCONDUCT AND WILL BE DEALT WITH HARSHLY.**

Regrade submittal procedure: Email Matt Bowman that you are submitting an exam for a regrade. Write on the exam score sheet which problem needs to be regraded and why. **DO NOT CHANGE ANYTHING ELSE.** Place the exam in Matt Bowman's mailbox in Chemistry 1146.

Any student that falls just below a cutoff will have their final exam automatically regraded.

Exam Penalties:

Though technically, the regular exams are worth 100 points apiece and the final exam is worth 200 points, it is possible to score a negative value on the exam. There are four exam penalties that you should be aware of and **AVOID** at all costs. **CONSIDER YOURSELF WARNED.**

Texas Carbon Penalty (TCP): If one of your answers has a carbon drawn that has five bonds to it, that is an affront to organic chemistry. Such a blasphemous creation will result in a five point penalty in addition to missing any points on that question.

Acid-Base Arrow Question (AB AQ): To describe what is happening in a reaction, chemists used the curved arrow notation. This shows the movement of electrons. The most important example of this is in acid-base reactions. I will show you the answer to this question along with examples of wrong answers. **THIS IS THE ONE OF THE MOST FUNDAMENTAL CONCEPTS IN ORGANIC CHEMISTRY.** It is used in 343, 345, 344, biochemistry, etc... If you cannot answer this question, then -5 points.

Name Penalty: The most important question on any exam is the one that has you fill in the following blank:

Name: _____

Yet, the number of people that do not do this are staggering. (8% of the exams last semester left this blank or missed it).

EIGHT PERCENT!!!!!!!!!! There is no excuse for this.

- 1.) You will need to write your name (First and Last) on the name line appearing on the scoresheet and the page with problem one.
- 2.) You will need to circle your TA's name on the scoresheet.
- 3.) You will need to write the first two letters of your last name (legibly) in a box. (**NOT INITIALS**)

You must do all three of these to avoid the 2 point Name penalty.

Time Penalty: Writing on the exam before the TA's say start or after time is called can be a five point penalty.

After that whole exam penalty rant, here is a photo of a cat.



Participation Points:

Part of your grade will be determined by participation. You can have a maximum of 30 participation points. With that said, there will be more than that many possible. I estimate about 60 participation points will be available, but again only 30 will count. There are a couple of ways that you can earn a participation point. The participation points will only be tallied on **Dec 8** and not before then. One semester, when the tally reached 30 points, people stopped participating. Hence, no tallying until the end of the semester.

iClickers: From time to time, there will be iclicker questions in lecture. If you get it right, you will receive a participation point. If you get it wrong then you will receive a half point. *You must register your iclicker on learn@UW.* If it requires you to pay money to register because you purchased a used clicker, email me your iclicker ID. I will send you an email if your iclicker is not registered. Be sure to use frequency BB. You set the clicker frequency by holding down the power button until the light blinks and then pressing the B button twice. We will have a clicker test each week during the first three weeks, if your iclicker is not registered by the third week, **oh well.**

Turn-In Problems: From time to time in the problem set, there will be a turn in problem. You will get a point if you attempt it and turn it in to Matt's mailbox in Chem 1146 by the specified date and time. I will not announce a head of time if a turn in problem is in the problem set. So, it may be in your best interest to thumb through them when they are handed out. After removing names, some of these answers will be selected, scanned and posted. Later on, I will post why these were chosen and point out the common mistakes and misconceptions.

Electronic Homework: If you are a fan of electronic homework, then this option will be available to you, but it is not required. There will be a series of problems each week. You need to get at least half of them correct (you can attempt these problems multiple times) to get the participation points. Each weekly problem set will be worth one participation point (provided it is accomplished by the deadline). It costs \$38, though some of you may have purchased it with your textbook. **I want to stress that it is not required.** There will be plenty of other opportunities for participation points.

Discussion Attendance: Attending your **registered** discussion section is worth one point each day you attend. Going to a different section does not count. This is to discourage squatters. Signing the attendance sheet and then leaving does NOT count as a participation point. The TA's are there to help you. Willful disregard of them or their efforts will not be rewarded.

Discussion Pop quizzes: The TA's will from time to time give a pop quiz without any warning. These can be worth 0,1, and 2 participation points. Please do not abuse the participation point system. Going to an earlier section seeing the quiz and then taking it in a later session or sharing the quiz questions with another student is academic misconduct.

Academic Misconduct

You are all adults. There is no reason to cheat, but plenty of reasons not to. An **F** in the course is one of many reasons. Cheat sheets, notes, textbooks, someone else's paper, the internet, cell phones, a crystal ball bearing the disembodied spirit of the Great Organic Chemist R. B. Woodward, etc... are prohibited from the exam. Use of these prohibited materials during an exam will result in a zero for the exam score. A zero on an exam due to cheating cannot be dropped. You will only be allowed pencils/pens and model kits for the exams.

A percentage of the exams will be photocopied. Should an answer be changed and submitted for a regrading, academic misconduct has occurred and the perpetrator will receive an F in the course and be reported to the Dean's office.

Since it is possible that not all students will take the exam at the same time, it is theoretically possible for some students to receive advance knowledge of a quiz/exam. Students leaking test/quiz questions to other students that have not taken the exam is also regarded as academic misconduct and shall be dealt with accordingly.

I have been advised by the staff (some of them legal staff) that I cannot use pepper spray in dealing with wandering eyes. I will try to remember to remind the TAs proctoring the exams of that advice. If the TAs suspect anyone of this condition, they will announce for everyone to keep their eyes on their paper. If the problem persists, the TAs have the discretionary power to move any student suspected during an exam. **You must be above reproach.** Exams of adjacent students will be examined, and should there be ample evidence, lower exam scores including zeroes will be given to the perpetrator. Please fight against wandering eyes. Please shield your paper the best you can to remove any temptation from others.

Since iclickers count as participation points. Having someone click in for you (*ie*: you are not actually present) counts as academic misconduct.

DO NOT TRY TO CHEAT. I have failed students in the past and I will not hesitate to do so this semester. I have no patience or respect for those that cheat.

Study tips

Between 1-4 hours after each lecture, start the problem set. **Do not wait for the answer key to be posted to start the problem set.**

Between 4-8 hours after each lecture, recopy your notes for that lecture. Look for the patterns.

Organic chemistry is very cumulative. Once you start, you cannot stop. (Oh and you need to start right away). Material on exam I will be tested again on exams II, III, IV, and the Final. Likewise, with subsequent topics. The problem sets will not only cover current material but past material as well.

In the course schedule, the relevant page numbers from the text are listed. The exams are going to be based on the material from the lectures, lecture notes, problem sets, and discussions. The text is there to help you understand the material. I strongly suggest that you read the relevant pages either before or after lecture.

Make flash cards. Carry these with you wherever you go. Flip through them throughout each day.

A very good way to study is to study in groups. Multiple problem sets will be available to work on along with several practice exams. I suggest you form groups to study in. You can go about this by talking to classmates in discussion, etc... The sooner you set up these groups the better off you will be. If you wish a classroom to meet in, I can see about reserving one for you.

The best way to understand organic chemistry is constant practice. The TA's and I will do our best to provide quite a bit of practice in the form of problem sets and practice exams. Should you desire more practice, there are the problems at the end of each chapter in the book as well as multiple websites. Should you find a discrepancy in what the TA's, book, internet, or myself, please bring it to our attention immediately. It may be a case of a subtlety, an outright error, or an over generalization. Regardless, we'll try to explain the discrepancy.

Don't expect miracles. Start studying day one and never stop. If you start studying a day or two before exams, you will likely come up with a score of 60 **at best**.

Discussion Sections

Due to the generous funding by the Madison Initiative for Undergraduates and the College of Letters and Science, we are able to offer discussion sections. There is a lot of material to cover, and little time to cover it. Sometimes, what I can briefly cover in the lecture will be better covered in your discussion section. The TAs in this course have experience in teaching organic chemistry, through labs, discussion sections, and tutoring. They may have a different way of looking at a topic. As a result, if you do not understand something from me, you may understand it from them. All discussion sections are held in the chemistry building.

Section 401 Fridays	1:20-2:10	2373	Jordan Ho
Section 402 Fridays	2:25-3:15	2311	Jordan Ho
Section 403 Fridays	3:30-4:20	2373	Mingxue Huang
Section 404 Fridays	12:05-12:55	B351	Mingxue Huang
Section 405 Fridays	1:20-2:10	B351	Mingxue Huang
Section 406 Fridays	2:25-3:15	B357	Nicholas Walters
Section 407 Fridays	3:30-4:20	B357	Nicholas Walters
Section 408 Fridays	4:35-5:25	B357	Jordan Ho
Section 409 Fridays	1:20-2:10	B357	Nicholas Walters

Proper use of discussion sections:

Make mistakes. People learn from mistakes. Be vocal. Go to the front of the board and write your answers. If they are correct, congratulations. If they are incorrect, *all the better* as it gives an opportunity to learn something and help out your fellow classmates. Remember, you are only really judged by your exams. Not your peers. Do not be afraid making mistakes. Better to make them in discussion than on an exam. There are many correct answers in organic chemistry (and many more incorrect ones). The TA's are there to give insight on the nuances of organic chemistry.

Get to know your fellow students. Set up study sessions with them. Try problems from problem sets independently and then consult on the answers before looking at the answer key. Try teaching each other.

Improper use of discussion sections:

Just sitting there.

Additional Help

In addition to the TA's and my office hours, there are a couple of places where you can find assistance.

The Organic TA Office is in room B317. There is a schedule posted outside the door of various TA's and when they will be available to help you. Feel free to ask any of them for help even if they are not a TA for Chem 343.

Alpha Chi Sigma Chemistry Fraternity has offered tutoring for chemistry classes in the past. Please contact them about their current help sessions.

GUTS offers tutors as well. They can be contacted at:
Student Activity Center
Office #4413
333 E Campus Mall
Madison, WI 53715-1380
Phone: 608-263-5666
E-mail: guts@rso.wisc.edu
<http://guts.studentorg.wisc.edu/>

There are also private tutors available. The General Chemistry Office (Room 1328) has a list of tutors and prices. If you do work with a tutor, please let them know that I post notes, problem sets, practice exams, and tutorials on Learn@UW. Anyone can access the Learn@UW Chem 343 site by using the visitor login.

They should go to learnuw.wisc.edu and click on visitor login.

USER NAME: **orgchem.pseudo**

PASSWORD: **orgchem.pseudo**

They will be able to access any handouts using that login.

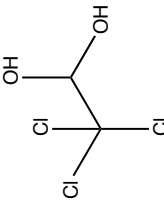
OCTOBER 2015

Chem 345

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
5 Nitrile Chemistry and Strecker Synthesis pg 1065-1067, 1388-1389	6	7 Irreversible Rxns: Carbanions and Hydrides pg 1079-1083, 1086	8	9 Rearrangements: Baeyer-Villiger Beckmann	10	11
12 Review Exam II 7:15 pm-8:45 pm	13	14 EAS: Halogenation and deuteration pg 799-803, 810-820	15	16 EAS: Halogenation and deuteration pg 799-803, 810-820	17	18
19 EAS: Friedel Crafts Vilsmeier-Haak pg 805-810	20	21 EAS: Sulfonation and Nitration pg 803-804, 822-825	22	23 Sandmeyer Reaction pg 1206-1209	24	25
26 Clemmensen Wolff-Kishner Reduction pg 988-990	27	28 Nucleophilic Aromatic Substitution pg 885-887, 1342-1345	29	30 Specialized Bromination pg 841-845, 1113-1118 Drop Date	31	
		NOTES: Students that do not have more than 100 exam points by drop date (March 30) rarely earn a grade higher than a C.				

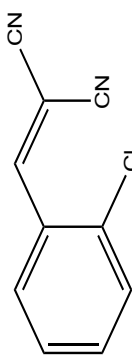
NOVEMBER 2015

Chem 345

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
						1
2 Review Exam III 7:15 pm-8:45 pm	3	4 Hoffmann and Curtius Rearrangements pg 1216-1220	5	6 Tautomerization and Aldol Reaction pg 1103-1113, 1119-113,1152-1153	7	8
9 Tautomerization and Aldol Reaction pg 1103-1113, 1119-113,1152-1153	10	11 Claisen pg 1133-1152, 1030-1032	12	13 Conjugate addition, Michael Rxn, Robinson pg 1156-1166	14	15 Spot Checks Union South 4-7 pm
16 Mannich Not in book (Aldol with an imine electrophile)	17	18 Umpolung Benzoin Condensation Dithiane Reactions (Not in book)	19	20 Enamine pg 986-987 Cuprates pg 1168-1171	21	22
23 Review Exam IV 7:15 pm-8:45 pm	24	25 13C NMR and IR pg 569-590	26	27 No Class	28	29
30 Advanced Organometallics: Suzuki and Heck Rxns pg 891-906			NOTES: Chloral hydrate is an example of a stable hydrate due to the presence of three electronegative chlorines destabilizing the aldehyde. It is widely used in 1920 crime novels as knockout drops or "Mickies." On a historical basis though, it the the cheap starting material for the infamous insecticide DDT, which limited the spread of malaria and of the bald eagle.			

DECEMBER 2015

Chem 345

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
1	2	3	4	5	6	
	Grubbs Alkene Metathesis pg 907-911	Pericyclic Reactions pg 1449-1458	Pericyclic Reactions pg 1449-1458	Pericyclic Reactions pg 1449-1458		
7	8	9	10	11	12	13
Pericyclic Reactions Cycloadditions Diels Alder pg 1463-1467	Pericyclic Reactions Electrocyclic Reactions pg 1458-1462	Pericyclic Reactions Electrocyclic Reactions pg 1458-1462	Pericyclic Reactions Sigmatropic Rearrangements pg 1467-1479	Pericyclic Reactions Sigmatropic Rearrangements pg 1467-1479		
14	15	16	17	18	19	20
Review Day		No Class		Star Wars premier (Don't expect much from Matt on this date)		
21	22	23	24	25	26	27
Final Exam 7:45-9:45 AM						
28	29	30	31			
<p>CS gas (more commonly known as tear gas) is actually a solid that melts around 93 °C. Typically, it is dissolved in an inert non-flammable solvent such as dichloromethane and packed into canisters. Upon pulling a pen, a small incendiary vaporizes the solution and spreads it. It acts as a REVERSIBLE Michael acceptor to nucleophilic sites around the eyes. This causes the burning sensation.</p>						
 <p>The image shows the chemical structure of 1-(2-chlorophenyl)-2,2-dicyanoethene. It consists of a benzene ring with a chlorine atom at the ortho position (position 2) and a 2,2-dicyanoethenyl group at the other ortho position (position 1). The 2,2-dicyanoethenyl group is represented as a carbon-carbon double bond where the terminal carbon is bonded to two cyano (CN) groups, and the other carbon is bonded to the benzene ring.</p>						

Add these numbers together:

946251.074373

9475780.400

Chem 345: Survey

Please answer the following questions so I can adapt Chem 345 to better suit your needs. Please turn this page in to Matt Bowman's mailbox in Chemistry 1146 by September 8.

What is your year? (Freshman, Grad Student, Returning Adult, etc...)

What is your major?

What do you hope to get out of this class? (Besides a good grade)

When is the ideal time for office hours (day and time)?

Do you learn a lot from textbooks?

Who was your 343 instructor?

What other classes are you currently enrolled in?

Have you found electronic homework to be helpful in your other classes?