

University of Wisconsin-Madison
CHEM 341: Elementary Organic Chemistry

Contact Information

Matt (Doc) Bowman

608-262-2519

(I will not be near my office phone, so email is the best way to reach me).

Chem B378

bowman@chem.wisc.edu

3 credits-Traditional Carnegie Definition

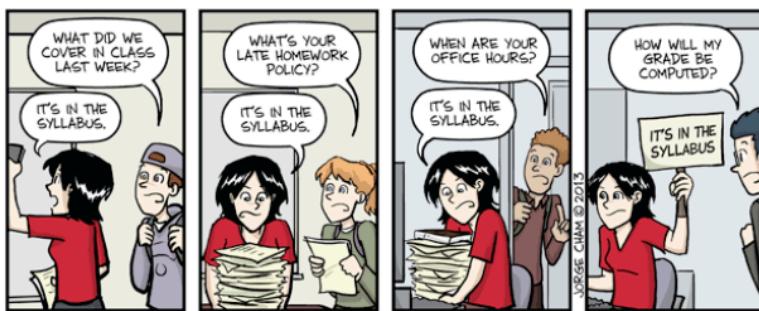
How Credit Hours are Met: This class is 3 credits. Three 50 minute prerecorded lecture videos will be available each week. Students will be required to also meet for discussion in a virtual environment each week over the 14-week fall term. Over the course of the term, students are expected to engage in at least 135 hours of learning activities, which includes class attendance, reading, studying, preparation, problem sets, and other activities.

Course Description: Chemistry 341 is a single semester, terminal course covering selected topics in organic chemistry. Chemistry 341 is not equivalent to either Chemistry 343 or 345 and it does not satisfy the prerequisite for enrollment in Chemistry 345.

Prerequisite: Chem 104, 109, or 116; Not open to students that have taken Chem 343 or Chem 345

Course Designations: Intermediate level; physical science breadth; counts as L&S credit

Instructional Mode: online only



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

Lecture 1:

Lectures will be available Sunday night, Tuesday night, and Thursday night.

Office Hours

Matt Bowman will be available virtually on Blackboard collaborate to answer questions MWF from 11 am to noon.

Please post questions to the piazza page. Matt will design subsequent lectures and supplementary followup lectures based on questions featured in piazza posts.

Canvas URL: <https://canvas.wisc.edu/courses/203580>

Teaching Assistant

Jess Roberts

jroberts24@wisc.edu

Learning Outcomes:

- a.) Students will learn how to master an intellectual discipline that requires both understanding of a complex conceptual framework and memorization of specific facts. This general goal will be pursued in the specific context provided by introductory organic chemistry. There are different paths to achieving this learning outcome, because different people learn in distinct ways. Students will be challenged to determine the learning strategies and styles that are most effective for them. Achieving this learning outcome will empower students to master other disciplines they encounter subsequently as they pursue diverse careers. These later challenges will arise without the framework provided by a syllabus, a textbook, lectures, discussion sections and frequent assessments (exams). Therefore, Chemistry 341 is taught in a manner that encourages students to take responsibility for their own learning success.
- b.) Interpret, visualize, and predict reactivity of molecules by their Lewis structures
- c.) Solve problems by using different approaches

Grading:

The grade will be based on:

Exams (3 x 100 points)

Problem Set questions 40 points

Final Exam (200 points)

The maximum number of points possible will be **540 points**.

ABCDF:

If you earn 90% of the total points, you will receive an A.

If you earn 77% of the total points, you will receive *at least* a B.

If you earn 60% of the total points, you will receive *at least* a C.

If you earn 40% of the total points, you will receive *at least* a D.

There is more information further on in the syllabus.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform Matt of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Matt, will work either directly with you or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

<http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

DIVERSITY & INCLUSION

Institutional statement on diversity: "Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals."

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background - people who as students, faculty, and staff serve Wisconsin and the world."

<https://diversity.wisc.edu/>

Mental Health Resources:

Now is as good as time as any to talk about mental health. I realize you are under a lot of pressure. Some of that pressure is internal and some of that is external. Regardless of the source of the pressure, the pressure is very real. Students have a tendency to equate grades with future happiness. It is an understandable connection, but not really a true one. I have quite a few C's on my undergraduate transcript (a few in chemistry) and I still ended up with my dream job. I have had a student that received an F in organic chemistry and had to retake the class. She went on to medical school. So, a low grade is not the end of the world.

If disaster happens or at anytime you feel that you cannot cope with something, or just need to vent, there are resources available on campus for you. Take advantage of them.

University Health Services (UHS):

Offers group, individual, couple/partner therapy stress management, and disordered eating assessments and treatment at no cost. It also provides massage therapy, yoga, and other wellness services.

Student Activity Center 7th floor 608-265-5600

www.uhs.wisc.edu/mentalhealth/getting-started

Ask.Listen.Save: www.Asklistensave.org

Ask.Listen.Save. is a student org that aims to prevent suicide by reducing the stigma of mental illness. Through educating the student body, they aim to increase the awareness and create a safe environment in which students know they are not alone and can feel free to ask for help.

Student Activity Center Suite 3196

Badgerspill: www.badgerspill.com

Is a peer-to-peer support network of and for UW-Madison students. You can write in online to "spill" or vent privately about whatever you are going through and get unbiased feedback, empathy, and resources from other students who have dealt with similar situations. Both parties are anonymous to one another and the spiller gets multiple responses within 24 hours.

Please look on the canvas page for the mental health resource sheet for more resources.

STUDENTS' RULES, RIGHTS & RESPONSIBILITIES

During the global COVID-19 pandemic, we must prioritize our collective health and safety to keep ourselves, our campus, and our community safe. As a university community, we must work together to prevent the spread of the virus and to promote the collective health and welfare of our campus and surrounding community.

UW-MADISON BADGER PLEDGE

UW-MADISON FACE COVERING GUIDELINES

While on campus all employees and students are required to wear appropriate and properly fitting face coverings while present in any campus building unless working alone in a laboratory or office space.

QUARANTINE OR ISOLATION DUE TO COVID-19

Student should continually monitor themselves for COVID-19 symptoms and get tested for the virus if they have symptoms or have been in close contact with someone with COVID-19. Student should reach out to instructors as soon as possible if they become ill or need to isolate or quarantine, in order to make alternate plans for how to proceed with the course. Students are strongly encouraged to communicate with their instructor concerning their illness and the anticipated extent of their absence from the course (either in-person or remote). The instructor will work with the student to provide alternative ways to complete the course work.

Frank Discussion about Organic Chemistry, Learning Online and Covid-19:

Organic chemistry is different from any other course you have ever taken up to this point. Nothing has really prepared you for it. It is likely one of the few courses that you have will take that is completely cumulative. What we talk about the first day, you will need to know for all of the subsequent days. That applies to everyday. Moreover, there is a new language complete with hieroglyphics that you will have to learn and use right away. To be honest, I believe organic chemistry would be easy for grade school students to learn, because memorizing facts and absorbing information is easier at that age. As you age, it becomes harder to learn, so you will have to find a new method that works for you. This is one of largest reasons that organic chemistry is required for a lot of fields, is to do well in organic chemistry you will need to learn how to store a lot of information quickly, make connections from similar circumstances, approach problems from multiple angles, and be able to just try something.

Will learning Chem 341 virtually be as effective or as easy as an in-person lecture class?

My answer to that without a doubt is no. Let's face it, one thing that organic chemistry is not known for its ease of learning. Throw in the whole online virtual thing, and it becomes that much harder. Last spring was my first time teaching organic chemistry online and I did okay, but in no way was it a stellar job.

This will be my eleventh year teaching this particular course, but in many ways, it will be my first time teaching it. I learned from some mistakes made last semester going online that I will not repeat, but will likely make totally new mistakes. But that is how I learn, by making mistakes, learning, and fixing them. Then repeating this process over and over again. Oddly enough, that is one of the best ways of learning organic chemistry. We are going to try a few things out, reassess, and then tweak the system.

Now, let's talk about the system:

Lectures:

I will record a lecture on Sunday, Tuesday, and Thursday and make them available that night. Please watch them. I will be available on Blackboard collaborate on MWF from 11 am to noon to answer questions live. Feel free to post questions to piazza. I will look at the questions and based on those questions and those in the office hours sections, will record base part of the next lecture off of those questions. If there are a lot of questions or a misconception needs to be immediately fixed, an extra follow-up lecture can be posted. The lectures should be watched as soon as you can. Do not put them off. You will need to do something in the course each day, whether that be watching a lecture, reading the book/supplemental notes, or working on a problem set.

Midterm Exams:

We will have three midterm exams each worth 100 points. The exams will be held on Thursdays: October 1, October 22, and November 19. These exams will be submitted online. The exam will be available from 3 pm to 9 pm. Once you start the exam, you will have two hours to upload a scanned copy of your answers. The exams are designed to take 90 minutes to complete. The extra 30 minutes are there to account for technical issues relating to the scanning and posting of your answers. The uploads need to be pdf uploads. We reserve the right to narrow the time frame of the exam, should it be seen that academic misconduct has occurred.

Problem Sets:

Problem sets are going to contain a mixture of problems from the topics we just covered to topics that we covered a week or two weeks ago. A vast majority of the problems are for practice only and will not be graded. In **some of the problem sets, there will be a problem that will be graded, so it needs to be turned in by a certain time and date.** These problems are there to encourage you to keep up with the material.

Video lectures by topic

Canvas will host a variety of video lectures by topic.

These are typically 5-10 minutes long. They are there to highlight important concepts or clarify points in organic chemistry.

Discussion Sections:

The best instructors for organic chemistry are your classmates. Getting together, teaching each other concepts, starting fight clubs (though we are not allowed to talk about those), and discussing ideas is how students really progress in this subject. Problem is: the virus has made getting together an impossibility. The 6 foot rule makes it very difficult for two people to work on problems together. To make matters worse, organic chemistry is very dependent on drawing and illustrations to predict and explain reactivity.

Talking about it is very difficult: Now the triangle thingy breaks apart because a hexagon is happier. Ummmm.....right.

We are going to use the features with blackboard collaborate that allow you to draw structures on the screen along with other software. We want you to work together to discuss the problems with each other and make mistakes. It is best to have the courage to make mistakes here, where it does not matter than on an exam when it does. We want you to use this technology outside of discussions as well to meet up outside of class and work on problems and problem solving strategies.

Section 301 Tuesdays	3:30-4:20
Section 302 Tuesdays	4:35-5:25
Section 303 Tuesdays	3:30-4:20
Section 304 Tuesdays	2:25-3:15
Section 305 Tuesdays	2:25-3:15
Section 306 Tuesdays	4:35-5:25

Textbook: *Organic Chemistry with a Biological Emphasis volumes I and II* by Timothy Soderberg. There are page numbers of Soderberg listed in the syllabus along with keywords you can use to look up in the index of an organic textbook or even google. 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. The textbook can be downloaded free of charge at

http://facultypages.morris.umn.edu/~soderbt/textbook_website.htm

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. One of the practice exams will be in a format very similar to the actual exam. 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.

Final Exam:

The final exam will be worth 200 points and available on Monday, December 14 from 1:45 pm to 5:45 pm. Once you start the exam, you will have three hours to upload a scanned copy of your answers. The exams are designed to take 2 hours to complete. The extra 60 minutes are there to account for technical issues relating to the scanning and posting of your answers. The uploads need to be pdf uploads.

Exams will be graded and returned the following Monday via canvas. **LOOK AT THEM. UNDERSTAND WHAT YOU HAVE MISSED. MAKE SURE THE SCORES WERE ENTERED CORRECTLY. YOU WILL HAVE ONLY ONE WEEK TO REPORT DISCREPANCIES.**

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. Email Matt what needs to be regraded and why.

Final Exam Regrades: Final Exams will be posted to canvas accounts as soon as we are able to. Once posted, an email as well as the exam key will be sent to all students. At that point, you will have 24 h to proofread the grading and contact Matt with any errors. After 24 h have passed, Matt will set the final cutoffs and set grades. The final cutoffs will not be released.

Grading (As transparent as I can be)

The grade will be based on exams and select problem set questions.

The maximum number of points possible will be **540 points**.

ABCDF SIMPLY STATED

If you earn 90% of the total points, you will receive an A.

If you earn 77% of the total points, you will receive *at least* a B.

If you earn 60% of the total points, you will receive at least a C.

If you earn 40% of the total points, you will receive at least a D.

So if you receive an 88%, this can be an A, AB, or B depending on the final distribution. 89.5% is considered to be 90%.

That is just how it is. Don't blame me, blame math.

They assigned by numerical score only. No names are looked at during the process. First, the numerical totals are placed in a list and sorted from the largest to the smallest. Second, I use the cutoffs described in the syllabus. 89.5% is an A, 88.5% is an AB, so on and so forth. From that, I calculate the class GPA and compare it to the ten year historical GPA of 345 (2.81). If the class GPA is at or above the ten year historical GPA, the grades are what they are and they are submitted. If it is significantly lower, then a curve is applied based on the ten year historical percentages.

There are a few things that I can say with certainty:

The 40% line is a hard line. Any score below that will be an F. Regardless what exam averages are: The C line will never be lowered below 50%. A 52% may be a C or D.

The AB range and BC range is very small. Historically for organic chemistry it is small. For my classes, it has typically been one or two percentage points.

The cutoffs represented above are the curve. This is based on several semesters of organic chemistry, so you know how you are doing throughout the semester. The lines may dip a little, but not much. Especially the A line. The last few times I've taught, it has barely budged. Please do not be surprised if your total points are 85% and your letter grade is a B. If the lines are lowered, they will be lowered so that 25% of the class will receive at least an AB and at least 55% of the class will receive at least a BC. The DF line will not move and the C line will never dip below 50%.

The Final Cutoffs will not be released. There will always be someone with the highest AB, highest B, and so on. That is the way of the world. It is conceivable that someone will miss a cutoff by one point. We will try to choose the cutoffs so that does not happen.

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.

The exams are open book and open internet. They are not open classmate and open tutor. You can do internet searches, but you cannot post the question for someone to answer. There is a fine line between acceptable use of sources and academic misconduct. **DO NOT CROSS IT.**

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

THERE ARE NO ACCEPTABLE EXCUSES FOR ACADEMIC MISCONDUCT. I HAVE CAUGHT SEVERAL STUDENTS AND THEY NOW HAVE A DARK MARK ON THEIR PERMANENT RECORD. I HAVE NO SYMPATHY FOR THOSE THAT CHOOSE TO CHEAT.

Should questions to the exams appear on the internet, we will revisit the flexibility of exam times.

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 (ABAQ): 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 or leave this question blank, then -5 points.**

Time Penalty: You will have two hours to take and upload your exam to canvas. If it is submitted up to 10 minutes late, 5 points will be docked from your score. If it is between 10 and 20 minutes late, then your score will be divided by 2. Past 20 minutes and it will be a zero.

Any repeat violators of the Texas Carbon Penalty will face Penelope IV. She is a specially trained squirrel that will nip the toes of anyone that draws a carbon with five bonds to it. They said it could not be done, but never underestimate the power of cabin fever, chili cheese fritos, and a sock puppet.

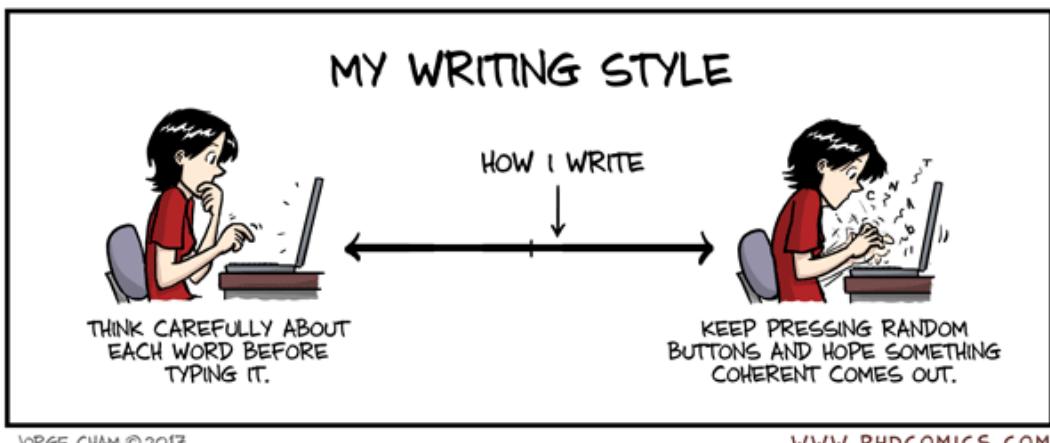


Letter of Recumderation Policee:

I try to teach about ~ 802.5 undergraduates each year. Unfortunately I won't be able to get to know all of you. That makes writing detailed letters nearly impossible. Rec letters from me will include grade and class rank and my impression of you. I can write them but I highly suggest that you get a rec from a prof in a small, higher level course or better yet a prof that you work for in a research group. They are more likely to give a better and more fuller depiction of you and will likely use spell check.

Piled Higher and Deeper by Jorge Cham

www.phdcomics.com



title: "How I Write" - originally published 1/27/2017

Yup. That pretty much sums me up (only more to the right on that particular writing spectrum).

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, 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. When I say come together in groups, please do so in a safe manner. Preferably, virtual groups using zoom or blackboard collaborate, etc...

Remember: organic chemistry is NOT worth your health.

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.

Additional Help

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

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 canvas. Anyone can access the canvas by going to:

<https://canvas.wisc.edu/courses/203580>

Here is a list of topics covered in Chem 341:
(This section is here to aid academic advisors at other institutions to determine credit transfers).

Molecular Structure:

- Lewis Structures
- Bonding (Covalent vs. ionic)
- Basic Molecular Orbital Theory
- Intermolecular interactions
- Hybridization
- Resonance
- Conformations
 - Linear alkanes
 - Cyclic Alkanes

Isomers:

- Constitutional Isomers
- Diastereomers
- Enantiomers

Nomenclature

- Bronsted/Lowry Acid Base Chemistry
- Lewis Acid/Base Chemistry
- Extra topics: symmetry and ^{13}C NMR

Functional Group Reactivity:

Alkyl halides:

Substitution and Elimination Chemistry

Alcohols:

Properties

Substitution and Elimination Chemistry

Oxidation

Alkenes:

Reactivity with acids

Carbonyl (ketones/aldehydes) chemistry:

Properties

Oxidation/Reduction

Nucleophilic addition

Grignards/Organolithiums

Hemiacetal/Acetal (Side topic sugars)

Imine

Cyanohydrin

Carboxylic acid deriv. (carboxylic acids, amides, esters, acid chlorides, anhydrides)

Properties

Oxidation/Reduction

Acyl transfer reactions

Fisher esterification, transesterification

Acid chloride reactions

Nucleophilic addition

Grignards/organolithiums

Properties of triglycerides

Properties of proteins

Reactions of nitriles

Enol/Enolate chemistry

Properties of enols/enolates

Tautomerization

Lobry de Bruyn-van Ekenstein Transformation

Aldol, Michael, Claisen

SEPTEMBER 2020

Chem 341

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	Page Numbers correspond to Organic Chemistry with a Biological Emphasis Volumes I and II by Timothy Soderberg	1	2	3	4	5	
6	7 Intermolecular Interactions vol 1 95-115	8 Nomenclature I tutorial	9 Hybridization vol.1 51-69	10 Nomenclature II tutorial	11 Resonance vol.1 81-90	12	
13	14 Conformations and cyclic alkanes vol.1 132-145	15 Nomenclature III tutorial	16 Conformations and cyclic alkanes vol.1 132-145	17 Nomenclature IV tutorial	18 Acid/Base Chemistry vol.1 331-373	19	
20	21 Acid/Base Chemistry vol.1 331-373	22	23 Lewis Acid Base Chemistry	24	25 Stereoisomers Enantiomers vol.1 146-181	26	
27	28 Stereoisomers Enantiomers vol.1 146-181	29	30 In Class Review Exam I 7:15-8:45 PM				
30							NOTES: 1-adamantylamine is an antiviral that was once used to treat influenza but no longer. Side effects include "nervousness, anxiety, agitation, insomnia, difficulty in concentrating" according to Wikipedia. Yep, 1-adamantylamine is definitely a molecule to associate with organic chemistry.

OCTOBER 2020

Chem 341

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 Exam One	2 Substitutions: SN1 vol. I 385-423	3	
4	5 Substitutions: SN2 vol. I 385-423	6	7 Substitutions: SN1 vs. SN2 Energy Diagrams vol. I 385-423	8	9 Eliminations: E2 vol. II 241-246	10	
11	12 Eliminations: E1 vol. II 241-246	13	14 Reverse E1 HX Addition to alkenes vol. II 228-237	15	16 Carbocation Rearrangements vol. II 254-259	17	
18	19 Oxidation of Alcohols PCC and H ₂ CrO ₄ vol. II 278-280	20	21 In Class Review Exam II 7:15 pm-8:45 pm	22 Exam Two	23 Carbonyl Chemistry Grignard/NaBH ₄ vol. II 300-301 (Not really covered)	24	
25	26 Carbonyl Chemistry Cyanohydrin Not in Book	27	28 Carbonyl Chemistry Hemiacetal/Acetal vol. II 53-71	29	30 Carbonyl Chemistry Imine vol. II 76-79	31	
					NOTES: Drop Date is November 1. If you do not have at least 80 points by this point, consider dropping the course as it will be very difficult to pass.		
							

NOVEMBER 2020

Chem 341

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DECEMBER 2020

Chem 341

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2 Claisen vol. II 199-206	3	4 Michael vol. II 207-210	5
6	7 Applications of Aldol, Michael, Claisen	8	9 Review Last Day Email topics to Matt	10	11	12
13	14 341 Final Exam 2:45 PM-4:45 PM	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOTES:

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 cannisters. 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.

