



## CHEM343 – SYLLABUS – Spring 2019

### COURSE OVERVIEW

**Official Course Description:** Chemistry 343 covers fundamental aspects of organic molecular structure, including stereochemistry, and introduces basic themes in organic reactivity. It is the first semester of a two-semester organic chemistry sequence. Chemistry 345 is the second course in the sequence. Class is for students expecting to take two semesters of organic chemistry.

**Requisites:** The following courses are prerequisites: Chem 104, Chem 109, or Chem 116

**Meeting Time and Location:** MWF 9:55am – 10:45am in EDUC SCI 204

**Canvas course URL:** <https://canvas.wisc.edu/courses/125430>

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

**Number of credits:** 3 credits / **Instructional Mode:** All face-to-face

**Credit Hours are met by the Course via the traditional Carnegie Definition.** The class meets each week for three 50-minute lectures and one 50-minute discussion. Over the course of the semester, students are expected to perform at least 135 hours of learning activities, which include class and discussion attendance, reading, studying, preparation and problem sets.

### INSTRUCTORS & TEACHING ASSISTANTS

**Instructor:** Professor Zachary K. Wickens

**Office hours:** Tuesdays at 1:15 pm in room 9341 Chemistry Building

**Instructor Email/Preferred Contact:** [wickens343-19@chem.wisc.edu](mailto:wickens343-19@chem.wisc.edu)

**Teaching Assistants:** Kimberly Deglopper ([deglopper@wisc.edu](mailto:deglopper@wisc.edu))  
Oliver Williams ([opwilliams@wisc.edu](mailto:opwilliams@wisc.edu))

Note: Piazza is an online resource used in this course to help us efficiently answer your content questions. Please take advantage of this resource in addition to attending regularly scheduled to office hours. *Content questions will never be fielded by the TAs or by the professor via email.*

**TA Office Hours:** You are welcome to attend office hours with *any* CHEM343 TA. Times: [chem.wisc.edu/deptfiles/OrgLab/handouts/Organic TA Office Hours Spring 2019.pdf](http://chem.wisc.edu/deptfiles/OrgLab/handouts/Organic_TA_Office_Hours_Spring_2019.pdf). These times are subject to change but the linked data will be updated regularly.

## COURSE MATERIALS

**Required:** "Organic Chemistry" by Marc Loudon and Jim Parise, 6<sup>th</sup> Edition. There is an accompanying Study Guide and Solutions Manual. The textbook/manual bundle is available from the University Bookstore and likely other sources. The course will cover Chapters 1-11, 14, and 15 in Loudon.

**Strongly Recommended:** *Molecular Model Kit:* Several model kits are available online, at the UW Bookstore, online and from AXΣ. It is not important which model kit you acquire, none of them are perfect and all are helpful. You will be allowed to use a model kit on the exams.

*ChemDraw:* ChemDraw is an expensive piece of chemistry software but as a UW student, you get ChemDraw free! This is pretty awesome! I highly recommend downloading the software ([comphelp.chem.wisc.edu/content/downloading-chemdraw-15](http://comphelp.chem.wisc.edu/content/downloading-chemdraw-15)) and using it whenever you are posting on Piazza. It is the same software that we use to draw all of the molecules for your problem sets, quizzes, and exams.

## GRADING

A maximum of 550 points can be earned over the course of the semester. Your final score will be calculated using one of the following formulae, depending on which results in the higher grade in the course.

### Formula 1

Exam 1	100
Exam 2	100
Exam 3	100
Discussion	50
Final Exam	200

**TOTAL**                    **550**

### Formula 2

Top two midterm exams	200
Discussion	50
Final Exam	300

**TOTAL**                    **550**

**Midterm exams:** There will be three midterm examinations (100 points each). Exams will be given during the normal lecture period. Please note that makeup exams will not be given. However, you can still finish the class with a very high grade if you absolutely must miss an exam through formula 2.

**The exam dates:** Exams will be given in class on February 20<sup>th</sup>, March 13<sup>th</sup>, April 24<sup>th</sup>. The first exam will *focus* on chapters 1–4; the second on 5–7, the third on 8–11. *However, all exams will be cumulative.* Any content provided in the textbook, lecture or discussion sections is fair game for exams.

**Discussion section:** Attendance in your discussion sections is required and will be worth 50 points overall. I understand life events (illness, travel, etc) may require you to miss discussion

once or twice during the semester. With this in mind, *your first two absences from discussion* will not impact your grade—no explanation needed for the absence. Subsequent absences will cost 5 points and if you miss more than half of the discussion sections, you will sacrifice this portion of your grade entirely (0/50). On the other hand, if you simply show up to each discussion and participate, you will score a perfect 50/50!

**Final exam date:** The cumulative final exam will be given Friday, May 10<sup>th</sup> from 12:25p – 2:25p.

**Re-grade requests:** A re-grade request form is available on Canvas. These are due within 5 days of the date the exam was returned. Do not write on your exams. Submitting a modified exam for re-grading will be considered serious academic misconduct.

**Grade in the course:** The number of points you have earned over the course of the semester will be the *only* factor in determining your final course grade. Letter grades will be assigned based on historical norms for the course in the Department of Chemistry at UW–Madison. The distribution will curve around a low B average (~2.75 course GPA).

## CLASS CONDUCT, COMMUNICATION AND ETTIQUETTE

Chem 343 is an exceptionally large lecture course. In order to maintain an effective learning environment, I request that you work with me on the following points:

1. Content questions should be directed to Piazza and not sent via email to either the TAs or to me. Piazza is a great online resource where you can post and receive answers to your content questions. Chances are, others will have similar questions to you and Piazza allows us to capitalize on the large class size to deepen your mastery of organic chemistry by answering questions in a public forum. You also can and should suggest potential answers to student questions.
2. Don't hesitate to email me or your TAs if you have questions about the *logistics* of the course, concerns about your grades or if you'd like to set up a meeting.
3. Laptops and cell phones may not be used during lecture. Organic chemistry notes extensively involve diagrams and chemical structures and, as a result, you cannot take organic chemistry notes on a laptop! Texting or emailing during class is distracting to you, to me and to the people seated around you. Organic chemistry is already challenging enough, please don't make it harder.
4. If you feel like you're falling behind, don't feel shy about asking for help. There are a lot of resources available to help you succeed in Chem 343 and the TAs and I deeply care about your success in this course. However, due to the size of the class it will be difficult for us to identify you unless you actively seek our help.
5. Good letters of recommendation can tell a detailed story. Letters of recommendation that come from a large lecture class, by necessity, lack detail. I can write about the content of the class, your grade and rank compared to your classmates, and the efforts UW–Madison makes to combat "grade inflation." But I will never be able to write a letter that is as powerful as one from an instructor of a smaller course. As a result, I will typically only provide letters of recommendation for students who earn an A or AB in the

course and would encourage you to seriously consider what story I will be able to tell to advance your candidacy for whatever it is you are applying for.

## LEARNING OBJECTIVES

By the end of the course, students in CHEM 343 will be able to:

- Distinguish the structural features of different organic molecules and explain how molecular structure influences reactivity
- Explain concepts in organic chemistry using the technical language of organic chemistry
- Predict relative stability of different conformations of organic molecules
- Recognize the reactivity profiles of simple alkenes, alkanes, alkynes, alcohols, alkyl halides, and ethers
- Explain the mechanisms of common reactions for alkenes, alkanes, alkynes, alcohols, alkyl halides, and ethers
- Recognize standard organic reagents and solvents used to affect organic reactions
- Explain chirality and identify the stereochemical differences of organic molecules
- Recognize how reaction mechanism can influence stereochemical outcomes of these common reactions

Note: beyond these specific objectives, a primary goal of this course is to teach you to master complex and challenging subject matter. This is a skill that will translate into whatever else you do in college and beyond!

## HOW WILL I LEARN ALL OF THIS?

You will succeed in this class by participating in a diverse array of complementary learning activities. To help you make the most of these opportunities, I have outlined the *role* of each facet of this class and how you can leverage it to master the material presented in CHEM343.

### Lecture

The purpose of lecture is to provide a conceptual framework for you to understand the course material. Lecture will highlight key concepts and examples. Lectures will help you understand the course expectations. Lectures will introduce the foundation of learning but you cannot learn everything necessary for success in the course from lectures alone.

### Discussion Sections

The discussion sections will deepen your understanding of the course material through active problem solving. These sessions are led by experienced graduate students pursuing doctoral research in organic chemistry. Discussion sections will always involve group work of some form or another; you will not be passively listening to your TA talk about chemistry. They will also provide a chance to talk to your TA and classmates about problem solving strategies, difficult course concepts, and common misconceptions. Get the most out of each discussion by showing up ready to work and ready to discuss the week's material.

## Textbook Reading

The explanations and examples provided in the textbook will go further (both in breadth and depth) into the course material than is possible in a 50 minute lecture. As a result, it is quite difficult for most students to understand the course material at the level needed for a high-level of success without reading the textbook. Loudon's organic textbook was chosen for its clear explanations and great practice problems. At the start of each lecture, I will tell you which sections of the book the current and next lecture will emphasize. Additionally, the tentative date that we'll start each chapter is provided at the end of this syllabus. *I strongly recommend reading each chapter before each lecture.* A thorough reading of the textbook on any topic you are struggling with is also critical.

## Office Hours

Office hours with the TAs or with me will offer your opportunity to get in-depth help with content you are struggling with. Your TAs and I are highly concerned about your learning. Unfortunately, there are many 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. In the past, the most successful students have taken advantage of office hours on a weekly basis. You are encouraged to attend as often as you need and see any TA. Set an expectation for yourself to come to each meeting with a list of questions and clearly identified problems that they needed help solving.

## Piazza

Piazza is the resource we will use to field content questions throughout the course and your use of the platform will be integral to your success in Chem 343. Content questions will only be answered online by me or your TAs through Piazza and never by email. In addition to posing questions, Piazza provides the opportunity for students to try to answer each other's questions. *Attempting to answer questions posted by other students is one of the best ways for you to master the material yourself!* With this in mind, the TAs and I will always wait for at least four hours prior to answering any question on Piazza to give other students a chance to formulate a response. If you want a clear answer, please remember to be very clear when wording your questions on Piazza. Pictures of structures from ChemDraw (see above in course materials) are particularly helpful, however, pictures or scanned images are also okay to post on Piazza. Piazza can be accessed from within Canvas by the link on the sidebar.

## Practice Problems

Practicing is the only way to succeed at organic chemistry and the assigned problems give you the opportunity to practice! As we begin each chapter in class, I will provide a list of recommended problems on canvas. Additionally, each week in discussion, more problems will be provided than the 50 minute period will allow you to solve. The only way to make sure you are learning at the right depth and pace is to complete all of 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 will be provided to the problem sets and textbook has an accompanying solutions manual. Use these resources to check your work but *always write out a complete answer before checking the key.* Although the problem sets are not directly graded, you'll find yourself with much lower midterm exam grades if you do not complete the practice problems.

## Classmates

Your peers are an immensely valuable resource. 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.

## Exams

The exams are not just evaluation tools. These assessments are also teaching tools. They will give you the opportunity to clarify what you know and don't know. Use them to identify weak areas in your knowledge that you can address. The course is completely cumulative, so solidifying your understanding of topics from one midterm will be crucial to your success on the next exam.

## Tutors

The Department of Chemistry maintains a list of private tutors available for hire. Although the private tutors included on the list have been affiliated with the department in some way, we provide this list as a resource and cannot guarantee the quality of any individual private tutor. <https://www.chem.wisc.edu/content/tutors>

## RULES, RIGHTS & RESPONSIBILITIES

See the Guide's to [Rules, Rights and Responsibilities](#).

## ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, please see: [studentconduct.wiscweb.wisc.edu/academic-integrity/](http://studentconduct.wiscweb.wisc.edu/academic-integrity/).

## 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 faculty [me] 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. Faculty [I], will work either directly with the student [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/>

## TENTATIVE LECTURE SCHEDULE

*[Lecture topics may shift slightly to accommodate course pace]*

23-Jan	W	Chapter 1: Chemical Bonding and structure
25-Jan	F	
28-Jan	M	Chapter 2: Alkanes
30-Jan	W	
1-Feb	F	Chapter 3: Acids and Bases / Curved-Arrow Notation
4-Feb	M	
6-Feb	W	Chapter 4: Introduction to Alkene Structure and Reactivity
8-Feb	F	
11-Feb	M	
13-Feb	W	
15-Feb	F	
18-Feb	M	Chapter 5: Addition reactions of Alkenes
<b>20-Feb</b>	<b>W</b>	<b>EXAM 1 [Chapters 1–4] (in class)</b>
22-Feb	F	
25-Feb	M	
27-Feb	W	Chapter 6: Principles of Stereochemistry
1-Mar	F	
4-Mar	M	Chapter 7: Cyclic Compounds and Stereochemistry of Reactions
6-Mar	W	
8-Mar	F	
11-Mar	M	Chapter 8: Noncovalent Interactions
<b>13-Mar</b>	<b>W</b>	<b>EXAM 2 [Chapters 5–7] (in class)</b>
15-Mar	F	

*SPRING BREAK: March 16 – 24*

25-Mar	M	Chapter 9: Substitution and Elimination Chemistry of Alkyl Halides
27-Mar	W	
29-Mar	F	
1-Apr	M	
3-Apr	W	
5-Apr	F	Chapter 10: The Chemistry of Alcohols and Thiols
8-Apr	M	
10-Apr	W	
12-Apr	F	Chapter 11: Ethers, Epoxides, Glycols and Sulfides
15-Apr	M	
17-Apr	W	
19-Apr	F	Chapter 14: The Chemistry of Alkynes
22-Apr	M	
<b>24-Apr</b>	<b>W</b>	<b>EXAM 3 [Chapters 8–11] (in class)</b>
26-Apr	F	
29-Apr	M	Chapter 15: Dienes, Resonance and Aromaticity
1-May	W	
3-May	F	

<b>10-May</b>	<b>F</b>	<b>FINAL EXAM (12:25pm – 2:25pm)</b>
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