

University of Wisconsin-Madison
SYLLABUS
CHEMISTRY 343-004, INTRODUCTORY ORGANIC CHEMISTRY, FALL 2019
HONORS and MAJORS, LECTURE SECTION 4 (BURKE)

Official Course Description (as published in the catalog): 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.

Official Requisites (as published in the catalog): CHEM 104, 109, or 116

Instruction Mode: Face-to-Face

Course Designations and Attributes (from catalog): Intermediate level; physical science breadth; counts as L&S credit; accelerated honors

Credits: CHEM 343 is a 3-credit class that meets each week for three 50-minute lectures and one 50-minute discussion. Over the course of the semester, students are expected to engage in at least 135 hours of learning activities, which includes class attendance, reading, studying, preparation, problem sets, and other learning activities as described in the syllabus.

This course will be taught as a mix of traditional lecture, Socratic inquiry, and problem solving (active learning) formats. Unifying concepts of organic chemistry and deductive reasoning skills will be developed and applied to problem solving. Understanding and mastery (how and why) will be emphasized: this course is best approached NOT as an exercise in memorization of facts, but as an exploration of unifying themes and development of problem solving skills. The facts become more meaningful and easier to use and remember this way.

Time: 9:55-10:45am, MWF, room 1315 Chemistry Bldg.

Instructors: Professor *Steve Burke*, Room 7112; phone 262-4941; e-mail: burke@chem.wisc.edu
TA *Andrew Maza* (amaza@chem.wisc.edu)

Discussions: DISC 361, Mon., 4:35-5:25 pm, Room 2373

DISC 362, Tue., 1:20-2:10 pm, Room 2311

DISC 363, Tue., 4:35-5:25 pm, Room 2311

Weekly Problem Session by Prof. Burke: Wed, 5:30-7:00 pm, Room 1315, starting on Wed. 9/11

Office Hours: (Steve Burke), by appointment, Room 7112, Shain Tower.

343-004 TA Office Hours: (Andrew Maza). Mon 3:20-4:20, Tue 2:20-4:20 Room 6227 (Matthews wing, Chemistry). These are specific for our section.

Organic TA office hour schedule: 8:50-6:30 M-F, Room B317

https://www.chem.wisc.edu/deptfiles/OrgLab/handouts/Organic_TA_Office_Hours_Fall_2019.pdf.

Description and List of Fall 2019 chemistry tutors at <https://www.chem.wisc.edu/content/tutors>

Web Materials: All handouts, notes, old exams, keys etc. will be posted on Learn@UW (Canvas).

AV recordings of all lectures and PDF copies of all lectures posted on Learn@UW (Canvas)

Library Reserve: Textbook, Study Guide, and alternate texts on reserve in Study Room, 1371.

Required Course Materials:

Text: "Organic Chemistry, 6th Edition (2016)," by Loudon and Parise, ISBN 978-1-936221-34-9

Study Guide: "Study Guide and Solutions Manual to Accompany Organic Chemistry, 6th Edition," by Loudon and Parise (accompanies Loudon text), ISBN 978-1-936221-86-8

Molecular Models: HGS "C" Set, Darling, Proteus Framework or equivalent. MODELS ARE ALLOWED IN EXAMS.

****Sapling On-line Problem and Review Enrollment is Required****

You are encouraged to work together on these on-line problem sets. Discussion, reasoning, and convincing other group members of correct responses is a valuable learning experience.

STUDENT INSTRUCTIONS

1. Go to www.saplinglearning.com/login to create an account. If you already have a Macmillan Learning account you can log in with your existing credentials and skip to step 3.
 - a. Create your password and set all three security questions.
 - b. Start typing in your institution to select from the options that appears in the Primary Institution or School name field. If you institution does not appear you can add it by typing in the full name.
 - c. Accept the terms of use and click "Sign Up".
 - d. Check your email for the confirmation link to complete your registration and return to the login page.
2. Set your institution by searching using your institution's full name and selecting the appropriate option from the menu that appears.
3. Under Enroll in a new course, you should see Courses at [Your College]. Click to expand this list and see courses arranged by subject. Click on a subject to see the terms that courses are available.
4. Click on the term to expand the menu further (note that Semester 1 refers to the first course in a sequence and not necessarily the first term of the school year).
5. Once the menus are fully expanded, you'll see a link to a specific course. If this is indeed the course you'd like to register for, click the link.
6. *If applicable*, to access your ebook click on the image of the cover on the right sidebar of your course site. Create an account or log in with an existing Macmillan Learning eBook account.
7. **Need Help?** Our technical support team can be reached by phone, chat, or by email via the Student Support Community. To contact support please open a service request by filling out the webform:
<https://macmillan.force.com/macmillanlearning/s/>

The following link includes more detailed instructions on how to register for your course:

<https://macmillan.force.com/macmillanlearning/s/article/Sapling-Learning-Registering-for-courses>

LEARNING OUTCOMES

Students in Chem 343-4 will:

- Develop an understanding of the structures of organic molecules and how these structures influence their reactivity
- Develop knowledge of organic spectroscopic methods and related problem-solving skills
- Develop an understanding of chirality and the stereochemical differences of organic molecules
- Learn the reactivity profiles of simple alkenes, alkanes, alkynes, alcohols, alkyl halides, and ethers
- Become familiar with standard organic reagents and solvents used to effect these reactions
- Gain a detailed mechanistic understanding of common reactions for alkenes, alkanes, alkynes, alcohols, alkyl halides, and ethers
- Gain an understanding of the stereochemical outcomes of these common reactions

Exam Schedule: Exam 1, Wednesday, October 2, 7:30-9:15 pm (*room 1315*)

Exam 2, Wednesday, November 6, 7:30-9:15 pm (*room 1315*)

Exam 3, Wednesday, December 4, 7:30-9:15 pm (*room 1315*)

Final Exam, Saturday, December 14, 7:45-9:45 am (*room to be announced*)

Grading: Sapling On-line Problem Sets: 10% (50 pts, all or nothing for timely completion of assignments)

Discussion Quizzes: 10% (50 pts, 6 quizzes throughout semester—best 5 of 6)

Exams: 60% (3 exams worth 100 pts each)

Final: 20% (cumulative, 100 pts)

Grade determined by total points, $x/500$

Re-grading: Unfairly graded or wrongly totaled exams can be turned in for re-grading by stating on the exam cover which problem and describe in 10 words or less you why you deserve more pts. These will be carefully considered, **just give to Burke or Maza.**

Class grade is on total points (e.g. $x/500$) and is not on curve (not 10%A, 20%AB and B, 40%C, etc.; rather $>80\% = A$, even if everyone did (unlikely)—see **previous grade distributions at end of this syllabus**

Problem Assignments: (1) Use the Sapling problems and those within the text of each chapter and the to guide your study. (2) Use the following problems at the end of each chapter to test your knowledge, hone your skills, and prepare for exams. Additional problem sets and **practice exams** will also be provided. *Exam problems will resemble those on old practice exams. Working problems is VITALLY important: exam performance relates directly. Practice your problem solving skills to do well.*

Problems at end of chapters in Loudon for practice (not turned in or graded) THESE ARE MORE LIKE EXAM PROBLEMS THAN ARE THE SAPLING PROBLEMS. Actual practice exams and keys will be posted on Learn@UW site.

Chapter 1: 22, 23, 25, 28, 31, 32, 41, 45, 46

Chapter 2: 26, 27, 28, 29, 30, 31, 34, 36, 39, 44, 46, 47, 47, 48, 49, 50

Chapter 3: 33, 34, 35, 37, 39, 40, 41, 48, 51, 54, 58

Chapter 12: 26, 29, 34, 35, 40, 44

Chapter 13: 36, 37, 39, 40, 43, 44, 45, 54, 57, 58, 59

Chapter 4: 40, 41, 44, 47, 49, 50, 53, 55, 56, 57, 59, 62, 65, 67

Chapter 5: 27, 29, 30, 32, 34, 36, 39, 41, 43, 47, 49, 51, 54

Chapter 6: 26, 27, 28, 31, 34, 35, 37, 39, 45, 46, 49, 51

Chapter 7: 34, 35, 37, 38, 42, 43, 45, 47, 49, 51, 55, 59, 60, 63, 66, 68, 71

Chapter 8: 28, 31, 32, 35, 38, 39, 40, 41, 42, 43, 45, 46, 48, 50, 51, 54

Chapter 9: 44, 45, 46, 48, 49, 52, 53, 66, 60, 61, 62, 64, 66, 67, 68, 71

Chapter 10: 39, 40, 41, 48, 50, 55, 57, 59, 61, 65, 68, 69

Chapter 11: 44, 45, 46, 49, 51, 54, 56, 58, 60, 61, 63, 66, 69, 71, 72, 74, 77, 70, 81

Chapter 14: 26, 27, 28, 30, 33, 34, 38, 42, 44, 45, 46, 47

LECTURE, READING, AND EXAM SCHEDULE

Unit 1: 9/4, 9/6, 9/9, 9/11, 9/13, 9/16: Chapters 1 (Bonding and Structure), 2 (Alkanes), and 3 (Acid-Base and Curved-Arrow Formalism)

Unit 2: 9/18, 9/20, 9/23, 9/25, 9/27, 9/30: Chapters 12 (Introduction to Spectroscopy) and 13 (NMR Spectroscopy)

Wednesday 10/02 Exam I

Unit 3: 10/4, 10/7, 10/9, 10/11, 10/14, 10/16: Chapter 4 (Alkene Structure and Reactivity) and Chapter 5 (Addition Reactions of Alkenes)

Unit 4: 10/18, 10/21, 10/23, 10/25, 10/28, 10/30, 11/1, 11/4: Chapter 6 (Stereochemistry), Chapter 7 (Cyclic Compounds and more Stereochemistry) and Chapter 8 (Noncovalent Interactions and Intro. To Alkyl Halides, etc.)

Wednesday 11/06 Exam II

Unit 5: 11/8, 11/11, 11/13, 11/15, 11/18, 11/20: Chapter 9 (Chemistry of Alkyl Halides)

Unit 6: 11/22, 11/25, 11/27, 12/2: Chapter 10 (Chemistry of Alcohols and Thiols) and Chapter 11 (Chemistry of Ethers, Epoxides, etc.)

Wednesday 12/04 Exam III

Unit 7: 12/6, 12/9, 12/11: Chapter 14 (Chemistry of Alkynes and Introduction to Synthesis)

Saturday 12/14 Final Exam, 7:45-9:45 AM (CUMULATIVE)—use midterm exams to guide your study. We will schedule a final exam review session of two.

KEYS TO SUCCESS

- Keep up with reading and problem working. Don't let things slide. Study organic chemistry every day. Falling behind and cramming to catch up will wreck your semester and cause agony.
- Study the text intently--it is your primary source of factual information (it is your map on this quest, Burke and Maza are your guides).
- Practice, Practice, Practice--working problems develops skills and tests your knowledge.
- Make constant use of On-line Problems—it will pay off with more than 10% of your grade
- Make a stack of flash cards (do you even know what these are?) as we go through the semester. You can study them in the many short periods of time each day that might otherwise be wasted.
- Form study groups, and participate. Rarely is everyone in a group simultaneously stumped, whereas individuals often are, with time wasted and frustration built.
- Most of your learning needs to occur outside of class—developing your problem solving (O-Chem test taking) skills requires practice, much like playing a sport or a musical instrument.

PRIOR YEAR GRADE DISTRIBUTIONS IN BURKE HONORS/MAJORS SECTIONS

CHEM343_07 >79% A (13) 76-78% AB (6) 61-74% B (17) 56-59% BC (3) 41-49% C (3) <40% F (2)	CHEM343_10 >79% A (13) 74-78% AB (14) 61-73% B (16) 54-60% BC (1) <55% C (1)	CHEM343-13 >79% A (25) 76-79%AB(9) 61-75% B (28) 57-60% BC(4) <55% C (4)	CHEM343-16 >80% A (14) 75-79% AB (8) 62-73% B (12) 59 BC (1) <54% C (1)	CHEM343- Multiyear Averages; Every Year is Close to These >79% A 74-78% AB 61-73% B 55-61% BC <55% C or worse
CHEM343_08 >79% A (19) 73-78% AB (8) 61-72% B (12) 55-61% BC (1) 51-54% C (3) <50% F (2)	CHEM343-11 >80% A (10) 73-78% AB (8) 61-72% B (12) <53% C (3)	CHEM343-14 >79% A (20) 74-79%AB(9) 62-73% B (21) 55-61% BC(3) 53-54% C(1) <<40% F(2)	CHEM343-17 >80% A (19) 75-80% AB (6) 62-75% B (7) BC (0) C or worse (0)	
CHEM343_09 >79% A (20) 75-78%AB(15) 61-74% B (10) 55-60% BC(3)	CHEM 343-12 >80% A (23) 75-78% AB (11) 62-74% B (11) 55% BC (1) 43% F (1)	CHEM 343-15 >79% A (17) 75-79% AB (13) 62-74% B (15) 58-62% BC (2) <55 C (1)	CHEM 343-18 >80% A (18) 75-79% AB (10) 64-74% B (22) 54-61 BC (5) <54% C (3)	

UW-MADISON STATEMENTS ON RULES, RIGHTS & RESPONSIBILITIES

- See the Guide's [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, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: "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/>

Just for fun:

THESE MATH AND LOGIC PUZZLES ARE NOT MAGIC, AND NEITHER IS ORGANIC CHEMISTRY; BOTH ARE LOGICAL AND SYSTEMATIC

1089!

1. Pick **any** 3-digit number where the first and third digits are different.
2. Reverse the digits, and subtract the smaller from the larger to get 2nd number.
3. Reverse the digits of 2nd number to get 3rd number; add 2nd and 3rd numbers.

THE MONK'S TREK

Each year a monk would climb a treacherous, winding trail up a mountain to a shrine, leaving at dawn and arriving at sunset. The next morning he would climb back down, leaving at dawn. **Is there any spot on the trail that the monk passes at the same time of day going up and going down?**

GUESS THE UNSEEN DELETED NUMBER! (I don't think this is logical, but it is fun!)

1. Choose any 5-digit number where the digits are not all the same.
2. Scramble the digits, and subtract the smaller from the larger.
3. Secretly delete any digit (except zero) from this number, and total the remaining digits.
4. I say the deleted number is _____!

Organic chemistry can be described as the chemistry of carbon. WHY DO WE HAVE A CARBON-BASED LIFE FORM?