

CHEM 25: Organic Chemistry I
<https://moodle.drew.edu> (2010FA-CHEM-25)

Instructor

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Class

Mondays, Wednesdays and Fridays in BC-218

Laboratory

1:15-4:15pm M-F (S226)

Office Hours

Monday 4 pm (HS-212)

Tuesday, 10 am (HS-212)

Thursday 4:20 pm (*weekly review session* in HS-229)
or by appointment

Required Course Materials

1. *Organic Chemistry*, J. McMurry, 7th Ed.
2. OWL Access Code (www.cengage.com/owl)
3. Advanced Molecular Model Kit (Orbit Kit 68827W)

Recommended Course Materials

Highly recommended for anyone planning on taking Organic Chemistry II (these will be required for that course) and anyone wanting to have additional problems to work on.

1. *Organic Chemistry – A Guided Inquiry*, A. Straumanis, 2nd Ed.
2. *Student Study Guide and Solutions Manual for Organic Chemistry*, S. McMurry, 7th Ed.

Additional copies of all the books listed above are on reserve in the library.

COURSE OBJECTIVES

This is the first semester of a two-semester sequence of introductory Organic Chemistry. The major objective of this course is to learn *what* organic chemistry is and *how* organic chemistry relates to the rest of science and life. In particular, an objective of this course is for you to be able to explain, for any given reaction involving organic molecules:

- **Why did the reaction take place? (Energetics)**
- **How did the reaction take place? (Mechanism)**

Learning outcomes: The successful completion of Chem 25 will contribute to your

- Ability to communicate
- Ability to problem solve
- Ability to think critically
- Ability to process information and interpret data
- Ability to work with others
- Ability to learn independently
- Information literacy skills
- Laboratory skills relevant to organic synthesis and analysis

General knowledge objectives:

- To apply knowledge of the chemical and physical properties of atoms, bonds and molecules to *explain why* and *how* organic reactions take place
- To develop writing skills which allow the communication of complex material to a general audience
- To develop an understanding of organic chemistry laboratory techniques

Specific course objectives:

1. Determine how electrons are distributed in a covalent bond between any two atoms and explain the consequences when electrons in a bond are not shared equally between atoms
2. Draw and recognize resonance forms of a structure (resonance structures) and explain why molecules with more than one resonance structure are considered stabilized
3. Draw and recognize functional groups, and explain their characteristic chemical behavior
4. Perform conformational analysis to explain why one isomer may be favored over another
5. Define nucleophile and electrophile, and explain their relationship to acids and bases
6. Know the four general types of organic reactions
7. Use curved arrow formalism to explain a reaction mechanism
8. Apply knowledge of stereoisomerism and stability of reaction intermediates to predict the outcome of organic reactions
9. Use energy diagrams to describe a reaction mechanism
10. Define chirality
11. Draw the mechanism for different types of addition, substitution, and elimination reactions, and explain the conditions under which each reaction takes place
12. Apply MS, IR, and NMR spectroscopic data to determine the structure of an organic compounds

COURSE OVERVIEW

Classroom: The classroom part of this course will consist of lectures and activities involving team learning and problem solving. After completion of an activity in class, you are expected to do the related exercises from the worksheets as well as the assigned readings and suggested problems.

Assessments

Final Grade Calculation

		<u>Grading Scale</u>			
Quizzes:	12%	A	93-100	C	73-76
Exams:	25%	A-	90-92	C-	70-72
Final exam:	18%	B+	87-89	D+	67-69
Lab:	20%	B	83-86	D	63-66
Writing:	10%	B-	80-82	D-	60-62
Homework:	10%	C+	77-79	F	≤59
Team Performance:	5%				

Quizzes: Weekly quizzes will be given at the beginning of each Monday's class, except those days when an exam is given. These quizzes will be 10-minutes long. These quizzes will be cumulative, although an emphasis will likely be placed on more recently covered material. Students must show up on time; no time extensions will be permitted. There will be no make-up quizzes. *Each student's lowest quiz grade during the course of the semester will be dropped* when calculating the final grade.

Exams: Three in-class exams will be given throughout the semester. These exams will be cumulative, although an emphasis will likely be placed on more recently covered material. You may substitute your final exam grade for one of these exams. No make-up exams will be given. If you miss an exam, that is the exam for which your final exam grade will be substituted. If you know ahead of time that you will miss an exam, please contact me at least 48 hours in advance to discuss your options. **The final exam will be cumulative.**

Laboratory: The purpose of *doing* organic chemistry is to gain experience in how organic chemistry is accomplished. Attendance on your scheduled lab day is expected. Unexcused absences from lab may not be made up and you will receive no credit for that lab. Chronic laboratory absences will lead to severe penalties, and **missing more than 3 lab periods** without making up the activity will lead to failure of the course.

Homework: Like learning to play a musical instrument, or the lyrics to a song, practicing everyday is the key to success. **Online Homework** (OWL) is due each week (usually Sunday, 11:59 pm – see schedule). You should feel free to work on your OWL homework with other students, as long as it is not impeding your own learning. Your lowest OWL homework grade will be dropped. In addition, suggested problems from your textbook will be announced in every class. At minimum, you should do these problems *and be able to explain your solutions.* Do them more than once, and do not hesitate to work on problems that were not suggested. **Additional assignments throughout the course may also contribute to your homework grade.**

Writing:

You will be assigned a **sequenced writing assignment** during the semester. More details will follow. For the writing assignments, late papers will be accepted, but the grade of each assignment will be penalized 1-letter grade per 24 hours that the assignment is tardy.

Punctuality and attendance in lecture: Please be respectful of me and your fellow classmates and show up to class on time. In addition to mastering the material yourself, you are responsible for assisting the other members of your team in their understanding of the material. For this reason, attendance is required. *You are allowed three unexcused absences without penalty.* Any absence beyond this will result in a 0.5 point decrease (out of 5) in your **Team Performance grade.** For example, if you are absent five times, the highest your Team Performance grade can be is 4 out of 5. Throughout the semester, you will also be asked to assess yourself and your teammates. *These assessments will count towards your Team Performance grade.*

Special circumstances: If there are special circumstances, such as illness or other form of emergency, which should be taken into account with regard to any of the stated class policies, please inform me as soon as possible so that alternative arrangements can be made.

Academic accommodations: Should you require accommodations, you must file a request with the Office of Educational Affairs (BC 114, extension 3327). It is your responsibility to self-identify with the Office of Educational Affairs and to provide me with the appropriate documentation from that office at least one week prior to any request for specific course accommodations. There are no retroactive accommodations.

Academic ethics and integrity policy: You are expected to abide by the Drew University Standards of Academic Integrity. For the official policy go to: http://www.depts.drew.edu/composition/Academic_Honesty.htm. Plagiarism, whether deliberate or unintentional, and cheating on examinations, are not acceptable. Any such incidents will be referred to the Academic Integrity Committee.

COURSE SCHEDULE (SUBJECT TO CHANGE)

Week (class day)	Dates	Topic	McMurry
1 (1-3)	Aug 30 -Sept 3	Structure and Bonding OWL Assignment 1 Due (Sept 5, 11:59 pm)	1
2 (4-5)	Sept 8 - 10*	Polar Covalent Bonds, Resonance OWL Assignment 2 Due (Sept 12, 11:59 pm)	2
3 (6-8)	Sept 13 - 17	Resonance; Acids and Bases Alkanes OWL Assignment 3 Due (Sept 19, 11:59 pm)	2, 3
4 (9-11)	Sept 20 - 24	Alkanes, Cycloalkanes Overview of Organic Reactions OWL Assignment 4 Due (Sept 26, 11:59 pm)	3, 4, 5
5 (12-14)	Sept 27 - Oct 1	Alkenes (structure and reactivity) EXAM 1 (OCT 1)	6
6 (15-17)	Oct 4 - 8	Alkenes (reactions and synthesis) OWL Assignment 5 Due (TUES, Oct 5, 11:59 pm) OWL Assignment 6 Due (SUN, Oct 10, 11:59 pm)	7
7 (18-20)	Oct 11 - 15	Alkenes (reactions and synthesis) Alkynes OWL Assignment 7 Due (Oct 17, 11:59 pm)	7, 8
8 (21-22)	Oct 20 - 22*	Alkynes and Synthesis Stereochemistry Primary Paper (FRIDAY, Oct 22) OWL Assignment 8 Due (Oct 24, 11:59 pm)	8, 9
9 (23-25)	Oct 25 - 29	Organohalides Ann. Biblio. Due (THURS, Oct 28, 5pm) Reactions of Alkyl Halides OWL Assignment 9 Due (Oct 31, 11:59 pm)	10, 11

10 (26-28)	Nov 1 - 5	EXAM 2 (NOV 1) Reactions of Alkyl Halides OWL Assignment 10 Due (Nov 7, 11:59 pm)	11
11 (29-31)	Nov 8 - 12	Reactions of Alkyl Halides OWL Assignment 11 Due (Nov 14, 11:59 pm)	11
12 (32-34)	Nov 15 - 19	Spectroscopy Writing II Due (THURS, Nov 18, 5 pm) OWL Assignment 12 Due (Nov 21, 11:59 pm)	12
13 (35)	Nov 22*	Spectroscopy	12
14 (36-38)	Nov 29 - Dec 3	EXAM 3 (NOV 29) Spectroscopy	13
15 (39)	Dec 6	Special topics	(8)

* Short weeks (less than 3 classes)