

Organic Chemistry - CHM 2210 Syllabus

CHM 2210-8481, Spring 2008, Monday, Wednesday, Friday, 1:55 pm - 2:45 pm
Classroom FAB 105 (Fine Arts B 105)

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Course Description. The first half of the CHM 2210/2211 sequence, intended for majors and pre-professional students. A study of the structures, syntheses, and reactions of organic compounds.

Prerequisites. CHM 2046 and CHM 2046L or the equivalent.

1	January 7	1-1 – 1-4	Origins of Organic Chemistry, Atomic Structure, Octet Rule, Lewis Structures
2	January 9	1-5 – 1-8	Multiple Bonding, Electronegativity, Formal Charges, Ionic Structures
3	January 11	1-9 – 1-11	Resonance, Structural Formulas, Molecular Formulas, Empirical Formulas
4	January 14	1-12 – 1-14	Arrhenius Acids and Bases, Brønsted Acids and Bases, Lewis Acids and Bases
5	January 16	2-1 – 2-4	Wave Properties, Molecular Orbitals, Pi Bonding, Hybridization & Shapes PS#1
6	January 18	2-5 – 2-8	Drawing 3D Molecules, Hybridization and Geometry, Bond Rotation, Isomerism
	January 21	No Class	MLK Jr. Day
7	January 23	2-9 – 2-11	Polarity, Intermolecular Forces, Polarity Effects on Solubilities
8	January 25	2-12 – 2-14	Hydrocarbons, Organic Compounds Containing Oxygen and Nitrogen
9	January 28	3-1 – 3-4	Alkane Classification, Molecular Formulas, Nomenclature, Properties PS#2
10	January 30	3-5 – 3-9	Alkane Uses, Sources, Reactions, Structure, Conformation
11	February 1	3-10 – 3-13	Cycloalkane, Cis-Trans Isomerism, Stability, Ring Strain, Cyclohexane Conformations
12	February 4	3-14 – 3-16	Conformations of Mono- and Disubstituted Cyclohexanes, Bicyclic Molecules PS#3
13	February 6	Midterm Examination I (Chapters 1-3)	
14	February 8	4-1 – 4-4	Chemical Reactions, Methane Chlorination, Radical Chain Reactions, Thermochemistry
15	February 11	4-5 – 4-10	Enthalpy, Entropy, Bond Enthalpies, Kinetics, Activation Energy, Transition States
16	February 13	4-11 – 4-16	Multistep Reactions, Halogenation, Hammond Postulate, Reactive Intermediates
17	February 15	5-1 – 5-4	Stereochemistry, Chirality, <i>R</i> and <i>S</i> Nomenclature PS#4
18	February 18	5-5 – 5-9	Racemic Mixtures, Enantiomeric Excess, Conformationally Mobile Systems
19	February 20	5-10 – 5-12	Fischer Projections, Diastereomers, Multiple Asymmetric Carbons
20	February 22	5-13 – 5-16	Meso Compounds, Absolute & Relative Configuration, Properties, Resolution
21	February 25	6-1 – 6-5	Alkyl Halides, Nomenclature, Uses, Structure, Properties PS#5
22	February 27	6-6 – 6-9	Preparation, Substitution and Elimination, The S _N 2 Reaction
23	February 29	6-10 – 6-12	Nucleophile Strength, Substrate Reactivity, Stereochemistry
24	March 3	6-13 – 6-16	The S _N 1 Reaction, Stereochemistry, Rearrangements, S _N 1 vs. S _N 2
25	March 5	6-17 – 6-21	The E1 Reaction, Zaitsev's Rule, The E2 Reaction, Stereochemistry, E1 vs. E2 PS#6
26	March 7	Midterm Examination II (Chapters 4-6)	
	March 10	No Class	Spring Break
	March 12	No Class	Spring Break
	March 14	No Class	Spring Break
27	March 17	7-1 – 7-5	Alkenes, Orbital Description, Unsaturation, Nomenclature, Cis-Trans Isomers
28	March 19	7-6 – 7-8	Commercial Importance, Stability, Properties
29	March 21	7-9 – 7-11	Alkene Synthesis
30	March 24	8-1 – 8-4	C=C Double Bond Reactivity, Electrophilic Addition, Addition of H-X, Hydration PS#7
31	March 26	8-5 – 8-8	Oxymercuration, Alkoxymercuration, Hydroboration, Addition of X-X
32	March 28	8-9 – 8-12	Halohydrins, Hydrogenation, Carbene Addition, Epoxidation
33	March 31	8-13 – 8-16	Epoxide Opening, Syn Hydroxylation, Oxidative Cleavage, Polymerization
34	April 2	9-1 – 9-5	Alkynes, Nomenclature, Properties, Commercial Importance, Electronic Structure PS#8
35	April 4	9-6 – 9-8	Acidity, Synthesis from Acetylides, Synthesis by Elimination,
36	April 7	9-9 – 9-10	Addition Reactions of Alkynes, Oxidation of Alkynes PS#9
37	April 9	Midterm Examination III (Chapters 7-9)	
38	April 11	10-1 – 10-5	Alcohols, Structure, Nomenclature, Physical Properties, Commercial Importance
39	April 14	10-6 – 10-9	Alcohol and Phenol Acidity, Synthesis of Alcohols, Organometallic Reagents
40	April 16	10-10 – 10-12	Reduction of Alkyl Halides, Synthesis of 1° and 2° Alcohols, Thiols
41	April 18	11-1 – 11-4	Reactions of Alcohols, Oxidation States, Oxidation PS#10
42	April 21	11-5 – 11-9	Formation of Tosylates, Reduction of Alcohols, Halogenation
43	April 23	11-10 – 11-14	Alcohol Dehydration, Diols, Esterification, Inorganic Esters, Alkoxides PS#11
44	May 1	Final Exam (Chapters 1-11) Thursday, May 1st, 10:00 am - 12:00 noon, FAB 105	

Required Textbook: L. G. Wade, Jr. *Organic Chemistry, Sixth Edition*; Pearson Prentice Hall: Upper Saddle River, New Jersey, 2006. (ISBN 0131478710)

Highly Recommended Textbook: J. W. Simek, L. G. Wade, Jr. *Organic Chemistry: Solutions Manual, Sixth Edition*; Pearson Prentice Hall: Upper Saddle River, New Jersey, 2006. (ISBN 0131478826)

Supplementary Textbooks: Organic Chemistry Textbooks by: McMurry; Vollhardt & Schore; Morrison & Boyd; Bruice; Brown, Foote & Iverson; Wade; Hornback; Streitwieser & Heathcock.

E-Learning Website. All students will have access to the E-Learning website. The homepage for this course is:

<https://elearning.courses.ufl.edu/webct>

You will login with your Gatorlink account username and password. This is where you will find general class information, important news, office hours, handouts, class notes, and keys. This is also where you will be able to find out your point totals and histograms.

Class Requirements:

- 1) Eleven problem sets (20 points each; 200 points max; the lowest score will be dropped)
- 2) Ten in-class quizzes (10 points each = 100 points)
- 3) Three midterm examinations (150 points each = 450 total)
- 4) Final examination (250 points)

= 1000 points total

Problem Sets. Problem sets will be **due at 4:30 pm** on the designated due dates. They can be turned in after class or to the box by my office (318A Leigh Hall). Answer keys will be posted around this time. Please write only on the paper provided. The problem sets may be spot-graded; this means that only some or parts of the problems may be scored and contribute to the 20 points. The lowest of the eleven scores will be dropped. You may work in groups or alone. But, you may not copy answers. The problem sets are designed to prepare you for the examinations.

In-class Quizzes. The ten in-class quizzes, which will be unannounced and randomly distributed during the semester, will be short and are designed to encourage you to attend class and to keep up with the course. They may occur at the beginning, middle, or end of class. They should be very easy for those who have read the assigned material. The quizzes can only be taken during the class period in which they are administered. They cannot be made up without an official, written University excuse.

Midterm Examinations. There will be three midterm examinations and each will focus on the chapters designated. The midterms are not designed to be cumulative; but you may expect some natural amount of material from a previous midterm to be important and necessary. Please bring and display your Gator1 Card for the exams.

Final Examination. The final examination will be cumulative. To do well, it will be important to keep up during the semester and review all notes and assignments for the course. Working problems—frequently and consistently—may be the best overall approach to mastering the course material. Please bring and display your Gator1 Card for the final.

Grading. Grades will be curved based on points earned out of 1000. The curve will be based on the distribution and any result is possible. Everyone could receive A's; everyone could receive D's. There is no individual penalty for a class that performs well. The last time I taught sophomore organic chemistry, a typical distribution resulted and the grades were 15.7% A; 31.6% B; 28.9% C; 15.8% D; and 7.9% F (although most of the F's were given to students who gave up).

Assignment Regrading. If you have a question concerning the grading of an assignment, you may submit the entire assignment for complete regrading. The assignment must be submitted for regrading by the second class meeting after the date the assignment was returned to the class.

Online Note Templates will be available at E-Learning (see above) in pdf format. They are organized by book chapter. The templates are made and posted to help you follow the lecture; hopefully this will allow you to spend less time writing and more time thinking. Students are encouraged to print the note templates and bring them to class to facilitate notetaking. Except for Chapter 1, they will not be available in class.

Office Hours. Office hours will be scheduled shortly and will be posted on the E-Learning Website. They will likely be held in Leigh Hall 328 (the Polymer Conference Room). Additional/individual office hours should be possible and should be scheduled by email.

Makeup Examinations. Makeup examinations will be given only for University-excused absences provided the appropriate documentation is supplied within the allowed timeframe. Please inform me of an absence ahead of time whenever possible.

Returning Assignments. To facilitate the return of assignments, I request that you write your name and number (to be assigned) on the back of each assignment that is turned in—within one inch from the top. Thus, I will be able to turn them upside-down and alphabetize them for mass distribution on a table at the front of class.

UF Honor Code: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."** "The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior."

Cheating and Plagiarism. Cheating and/or plagiarism will not be tolerated. The minimum penalty will be an automatic zero on the assignment in question. Suspension from the University may also result. Do not risk it. It is not worth it. Plagiarism consists of passing off as one's own the ideas, words, writings, etc. that belong to someone else. You are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have that person's permission.

See:

<http://www.registrar.ufl.edu/catalog/policies/students.html>

<http://www.dso.ufl.edu/judicial/honorcode.php>

<http://www.dso.ufl.edu/judicial/academic.php>

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