Organic Chemistry I – CHM 2210 Syllabus

version 2.0

CHM 2210–4140, Spring 2016, Monday, Wednesday, Friday, 12:50 pm – 1:40 pm

Classroom: Flint 50

Professor Stephen A. Miller, miller@chem.ufl.edu, Office LEI 318A

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 6	**1.1**	Electronic Structure of Atoms
2	January 8	**1.2**	Lewis Model of Bonding
3	January 11	**1.3 – 1.4**	Functional Groups, Bond Angles and Shapes of Molecules
4	January 13	**1.5 – 1.7**	Polarity, Quantum Mechanics, Valence Bond and Molecular Orbital Theory
5	January 15	**1.8 – 1.10**	Resonance, Delocalized Systems, Bond Lengths, Bond Strengths
	January 18	**No Class**	Holiday – M. L. King Jr. Day
6	January 20	**2.1 – 2.3**	Alkane Structure, Constitutional Isomerism, Nomenclature **PS#1**
7	January 22	**2.4 – 2.5**	Cycloalkanes, Conformations of Alkanes
8	January 25	**2.5**	Conformations of Cycloalkanes
9	January 27	**2.6**	Cis/Trans Isomerism in Cycloalkanes and Bicycloalkanes
10	January 29	**2.7 – 2.9**	Physical Properties of Alkanes and Cycloalkanes, Reactions, Importance
11	February 1	**3.1 – 3.3**	Chirality, Stereoisomerism, The *R*,*S* System **PS#2**
12	February 3	**3.4 – 3.5**	Acyclics with Multiple Chiral Centers, Cyclics with Multiple Chiral Centers
13	February 5	**3.6 – 3.9**	Stereoisomer Terminology, Optical Activity, Biological Significance, Resolution **PS#3**
14	February 8		**Midterm Examination I** (Chapters 1-3)
15	February 10	**4.1 – 4.3**	Arrhenius Acids and Bases, Brønsted-Lowry Acids and Bases, pK_a
16	February 12	**4.4 – 4.5**	Acid-Base Equilibrium Position, Thermochemistry and Mechanisms
17	February 15	**4.6 – 4.7**	Molecular Structure and Acidity, Lewis Acids and Bases
18	February 17	**5.1 – 5.2**	Alkene Structure, Nomenclature **PS#4**
19	February 19	**5.3 – 5.4**	Physical Properties of Alkenes, Naturally Occurring Alkenes
20	February 22	**6.1 – 6.3**	Reactions of Alkenes–Overview, Reactive Intermediates, Electrophilic Additions **PS#5**
21	February 24	**6.3**	Electrophilic Additions
22	February 26	**6.3 – 6.5**	Electrophilic Additions, Hydroboration–Oxidation, Oxidation
	February 29[T]	**No Class**	Spring Break
	March 2[T]	**No Class**	Spring Break
	March 4	**No Class**	Spring Break
23	March 7	**6.5 – 6.6**	Oxidation, Reduction
24	March 9	**6.7, 29.6A,D**	Reactants and Products with Chiral Centers, Polymerization of Alkenes **PS#6**
25	March 11		**Midterm Examination II** (Chapters 4-6)
26	March 14	**7.1 – 7.5**	Alkyne Structure, Nomenclature, Properties, Acidity, Preparation
27	March 16	**7.6 – 7.9**	Electrophilic Addition, Alkyne Hydration, Reduction, Organic Synthesis
28	March 18	**8.1 – 8.4**	Haloalkane Structure, Nomenclature, Physical Properties, Preparation **PS#7**
29	March 21	**8.5**	Halogenation Mechanism
30	March 23	**8.6 – 8.8**	Allylic Halogenation, Radical Autoxidation, Radical Addition of HBr to Alkenes
31	March 25	**9.1 – 9.3**	Nucleophilic Substitution in Haloalkanes, Mechanisms, S_N1 and S_N2 Reactions **PS#8**
32	March 28	**9.3**	Evidence for S_N1 and S_N2 Reactions
33	March 30	**9.3 – 9.5**	S_N1 and S_N2 Reactions, Several Nucleophilic Substitution Reactions, Beta Elimination
34	April 1	**9.6 – 9.7**	Beta Elimination Mechanisms, Evidence for E1 and E2 Mechanisms
35	April 4	**9.8 – 9.10**	Substitution vs. Elimination, S/E Competitions, Neighboring Group Participation **PS#9**
36	April 6		**Midterm Examination III** (Chapters 7-9)
37	April 8	**10.1 – 10.3**	Structure and Nomenclature of Alcohols, Physical Properties, Acidity and Basicity
38	April 11	**10.4 – 10.5**	Reactions of Alcohols with Active Metals, Haloalkanes and Sulfonates
39	April 13	**10.6 – 10.9**	Dehydration of Alcohols, The Pinacol Rearrangement, Oxidation of Alcohols, Thiols
40	April 15	**11.1 – 11.5**	Structure of Ethers, Nomenclature, Physical Properties, Preparation, Reactions **PS#10**
41	April 18	**11.6 – 11.12**	Silyl Ethers, Synthesis & Reactions of Epoxides, Crown Ethers, Sulfides
42	April 20	**TBD**	**PS#11**
43	April 27	**Final Exam**	(Chapters 1-11) Wednesday, April 27th, 12:30 pm – 2:30 pm, Flint 50

T = Travel day for Dr. Miller. Lecture will be given by audio/video prepared by Dr. Miller. Questions answered by Teaching Assistants.

Required Textbook: Brown, Iverson, Anslyn, Foote. ***Organic Chemistry**, **Seventh** Edition*; Brooks/Cole, **2014**. (ISBN 133952844) http://www.amazon.com/Organic-Chemistry-William-H-Brown/dp/1133952844
1st chapter free (6th Ed.): http://www.cengagebrain.com/shop/content/brown5498x_084005498x_02.01_chapter01.pdf

Required Study Guide: Iverson, Iverson. ***Study Guide with Student Solutions Manual***; Brooks/Cole, **2014**. (ISBN 1285052617) http://www.amazon.com/Student-Solutions-Manual-Organic-Chemistry/dp/1285052617

Publisher's Sales Website: http://www.cengagebrain.com/course/1-23PFZ4Z
Publisher Support: http://support.cengage.com/magellanweb/ClassLandingPage.aspx?optyId=1-1ZVPNI8

Highly Recommended Model Sets: HGS Polyhedron molecular model student set, student organic chemistry-C
http://www.sigmaaldrich.com/catalog/search/ProductDetail/ALDRICH/Z277746 or
HGS Researcher model set, Organic chemistry-B
http://www.sigmaaldrich.com/catalog/search/ProductDetail/ALDRICH/Z277770 or
HGS Student model set, Fundamental organic chemistry
http://www.sigmaaldrich.com/catalog/search/ProductDetail/ALDRICH/Z277703 or

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

E-Learning Website. All students will have access to the E-Learning in Canvas website: https://ufl.instructure.com

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 4:00 pm** on the designated due dates. Answer keys will be posted around this time. The format is multiple choice with 20 questions and your answers will be turned in as an Assignment on E-Learning. 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 should 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.

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 next 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 download and/or print the note templates and bring them to class to facilitate notetaking.

Office Hours. Subject to change, office hours will be held **Mondays from 2:00 pm – 2:50 pm** and **Thursdays from 3:00 pm – 3:50 pm** in **Sisler Hall 340** (third floor, southeast corner). Occasionally, a student TA will substitute for Dr. Miller and notice of this should be posted online. Additionally, students are encouraged to visit the Organic Chemistry Learning Center, located in Rooms 257 and 258 in Flint Hall. This Center is staffed with Graduate Student Teaching Assistants in the mornings and afternoons Monday–Friday. The open hours of the OCLC are roughly 8:30 am to 6:00 pm and the final schedule will be posted on E-Learning.

Conflict Examinations. *Conflict examinations* will be given only for University-excused absences provided the appropriate documentation is supplied **one week in advance of the examination period.** Conflict exams are administered before the regularly scheduled examination; **no** makeup examinations will be given after the regularly scheduled examination.

Attendance. Attendance for this class is not recorded. However, the ten unannounced and random in-class quizzes will generally reflect your attendance pattern.

Class Numbers. To facilitate the grading and return of assignments, I request that you write your name and **class number** on each one. The class numbers will be assigned after a few classes.

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. For the seven semesters that I taught CHM 2210, the grade distributions are below. Note that the percent of students receiving some kind of A has varied from 19% to 50%, but has usually been near the lower end of that range.

Spring 2008:

Grade	#	percent
A	20	19.4 %
B+	13	12.6 %
B	16	15.5 %
C+	23	22.3 %
C	20	19.4 %
D+	1	1.0 %
D	5	4.9 %
F	4	3.9 %
I	1	1.0 %
Total	103	100.0%

Fall 2008:

Grade	#	percent
A	26	19.8 %
B+	13	9.9 %
B	38	29.0 %
C+	7	5.3 %
C	31	23.7 %
D+	3	2.3 %
D	6	4.6 %
F	7	5.3 %
Total	131	100.0%

Fall 2009:

Grade	#	percent
A	35	20.7 %
A-	6	3.6 %
B+	35	20.7 %
B	9	5.3%
B-	19	11.2 %
C+	23	13.6 %
C	30	17.8 %
C-	2	1.2 %
D+	3	1.8 %
D	2	1.2 %
D-	1	0.6 %
F	4	2.4 %
Total	169	100.0%

Fall 2011:

Grade	#	percent
A	27	16.0 %
A-	9	5.4 %
B+	12	7.1%
B	35	20.8 %
B-	29	17.3 %
C+	8	4.8 %
C	36	21.4 %
C-	4	2.4 %
D+	4	2.4 %
D	0	0.0 %
D-	0	0.0 %
F	4	2.4 %
Total	168	100.0%

Spring 2013:

Grade	#	percent
A	14	8.9 %
A-	15	9.6 %
B+	20	12.7%
B	25	15.9 %
B-	18	11.5 %
C+	18	11.5 %
C	19	12.1 %
C-	8	5.1 %
D+	8	5.1 %
D	3	1.9 %
D-	4	2.6 %
F	5	3.2 %
Total	157	100.0%

Fall 2013:

Grade	#	percent
A	39	22.5 %
A-	48	27.8 %
B+	11	6.4 %
B	7	4.0 %
B-	13	7.5 %
C+	29	16.8 %
C	19	11.0 %
C-	1	0.6 %
D+	1	0.6 %
D	2	1.2 %
D-	1	0.6 %
F	2	1.2 %
Total	173	100.0 %

Fall 2015:

Grade	#	percent
A	30	17.1 %
A-	26	14.8 %
B+	22	12.5 %
B	23	13.1 %
B-	2	1.1 %
C+	24	13.6 %
C	31	17.6 %
C-	8	4.6 %
D+	4	2.3 %
D	5	2.8 %
D-	1	0.6 %
F	0	0.0%
Total	176	100.0%

Accommodations for students with disabilities. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

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.dso.ufl.edu/sccr/honorcodes/honorcode.php

Stephen A. Miller
Associate Professor
Department of Chemistry
University of Florida
Gainesville, Florida 32611-7200
miller@chem.ufl.edu
http://www.chem.ufl.edu/~miller/