

# Organic Chemistry I – CHM 2210 Syllabus

version 2

CHM 2210–4B54, Summer B 2017,  
Monday, Tuesday, Wednesday, Thursday, Friday, 5:00 pm – 6:15 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.

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1	June 26	1.1 – 1.2	Electronic Structure of Atoms, Lewis Model of Bonding #1–9
2	June 27	1.2 – 1.3	Lewis Model of Bonding, Functional Groups #10–19
3	June 28	1.4 – 1.7	Shapes of Molecules, Polarity, Quantum Mechanics, VB and MO Theory #20–28
4	June 29	1.8 – 1.10	Resonance, Delocalized Systems, Bond Lengths, Bond Strengths #29–33
		2.1 – 2.2	Alkane Structure, Constitutional Isomerism #1–4
5	June 30	2.3 – 2.5	Alkane Nomenclature, Cycloalkanes, Conformations of Alkanes #5–10 PS#1
6	July 3 <sup>T</sup>	2.7 – 2.9	Physical Properties of Alkanes and Cycloalkanes, Reactions, Importance #18–22
	July 4	<b>Holiday</b>	Independence Day Holiday
7	July 5	2.5 – 2.6	Conformations of Cycloalkanes, Cis/Trans Isomerism and Bicycloalkanes #11–17
8	July 6	3.1 – 3.4	Chirality, Stereoisomerism, R,S, Acyclics with Multiple Chiral Centers #1–8 PS#2
9	July 7	3.5 – 3.9	Cyclics with Multiple Chiral Centers, Stereoisomer Terminology, Optical Activity, Biological Significance, Resolution #9–16 PS#3
10	July 10		<b>Midterm Examination I</b> (Chapters 1-3)
11	July 11	4.1 – 4.5	Arrhenius Acids and Bases, Brønsted-Lowry Acids and Bases, pK <sub>a</sub> , Acid-Base Equilibrium Position, Thermochemistry and Mechanisms #1–7
12	July 12	4.5 – 4.7	Thermochemistry and Mechanisms, Molecular Structure and Acidity, Lewis Acids and Bases #8–14
13	July 13	5.1 – 5.2	Alkene Structure, Nomenclature #1–8 PS#4
14	July 14	5.3 – 5.4	Physical Properties of Alkenes, Naturally Occurring Alkenes #9–10
		6.1 – 6.3	Reactions of Alkenes, Reactive Intermediates, Electrophilic Additions #1–7 PS#5
15	July 17	6.3 – 6.4	Electrophilic Additions, Hydroboration–Oxidation #8–15
16	July 18	6.5 – 6.7	Oxidation Reduction, Reactants and Products with Chiral Centers #16–24 PS#6
17	July 19		<b>Midterm Examination II</b> (Chapters 4-6)
18	July 20	29.6 A,D	Polymerization of Alkenes #1–3
		7.1 – 7.4	Alkyne Structure, Nomenclature, Properties, Acidity #1–5
19	July 21	7.5 – 7.9	Alkyne Preparation, Electrophilic Addition, Hydration, Reduction, Org. Synthesis #6–13
		8.1 – 8.2	Haloalkane Structure, Nomenclature #1–2
20	July 24	8.3 – 8.5	Haloalkane Physical Properties, Preparation, Halogenation Mechanism #3–10 PS#7
21	July 25	8.5 – 8.8	Mechanism, Allylic Halogenation, Radical Autoxidation, Radical Addition of HBr #11–18
22	July 26	9.1 – 9.3	Nucleophilic Substitution in Haloalkanes, Mechanisms, S <sub>N</sub> 1 and S <sub>N</sub> 2 #1–9 PS#8
23	July 27	9.3 – 9.5	Evidence for S <sub>N</sub> 1 and S <sub>N</sub> 2 Reactions, Several Nucleophilic Substitution Reactions, Beta Elimination #10–18
24	July 28	9.6 – 9.10	Beta Elimination Mechanisms, Evidence for E1 and E2 Mechanisms, Substitution vs. Elimination, S/E Competitions, Neighboring Group Participation #19–28 PS#9
25	July 31		<b>Midterm Examination III</b> (Chapters 7-9)
26	August 1	10.1 – 10.5	Structure and Nomenclature of Alcohols, Physical Properties, Acidity and Basicity, Reactions of Alcohols with Active Metals, Haloalkanes and Sulfonates #1–12
27	August 2	10.6 – 10.9	Dehydration of Alcohols, The Pinacol Rearrangement, Alcohol Oxidation, Thiols #13–18
		11.1 – 11.3	Structure of Ethers, Nomenclature, Physical Properties #1–3 PS#10
28	August 3	11.4 – 11.12	Ether Preparation, Reactions, Silyl Ethers, Synthesis & Reactions of Epoxides, Crown Ethers, Sulfides #4–15 PS#11
29	August 4		<b>Final Exam</b> (Chapters 1-11) In Class, Flint 50

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#xx–yy designates the slide numbers

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

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**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>

**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/2069250>

**Publisher Support:** <http://support.cengage.com/magellanweb/ClassLandingPage.aspx?optId=1-1ZVPI8>

**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.

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**E-Learning Website.** All students will have access to the E-Learning in Canvas website: <http://elearning.ufl.edu/>

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.

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**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**

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**Problem Sets.** Problem sets will be **due at 11:59 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.

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**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.

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**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.

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**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.

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**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.

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**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.

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**Office Hours.** Subject to change, office hours will be held **Mondays from 2:00 pm – 3:00 pm** and **Thursdays from 3:00 pm – 4:00 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 JHH 205 (Hernandez 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 9:00 am to 3:00 pm and the final schedule will be posted on E-Learning.

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**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.

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

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

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**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 eight 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.

<b>Spring 2008:</b>			<b>Fall 2008:</b>			<b>Fall 2009:</b>			<b>Fall 2011:</b>		
Grade	#	percent	Grade	#	percent	Grade	#	percent	Grade	#	percent
A	20	19.4 %	A	26	19.8 %	A	35	20.7 %	A	27	16.0 %
B+	13	12.6 %	B+	13	9.9 %	A-	6	3.6 %	A-	9	5.4 %
B	16	15.5 %	B	38	29.0 %	B+	35	20.7 %	B+	12	7.1%
C+	23	22.3 %	C+	7	5.3 %	B	9	5.3%	B	35	20.8 %
C	20	19.4 %	C	31	23.7 %	B-	19	11.2 %	B-	29	17.3 %
D+	1	1.0 %	D+	3	2.3 %	C+	23	13.6 %	C+	8	4.8 %
D	5	4.9 %	D	6	4.6 %	C	30	17.8 %	C	36	21.4 %
F	4	3.9 %	F	7	5.3 %	C-	2	1.2 %	C-	4	2.4 %
I	1	1.0 %				D+	3	1.8 %	D+	4	2.4 %
						D	2	1.2 %	D	0	0.0 %
						D-	1	0.6 %	D-	0	0.0 %
						F	4	2.4 %	F	4	2.4 %
Total	103	100.0%	Total	131	100.0%	Total	169	100.0%	Total	168	100.0%

<b>Spring 2013:</b>			<b>Fall 2013:</b>			<b>Fall 2015:</b>			<b>Spring 2016:</b>		
Grade	#	percent	Grade	#	percent	Grade	#	percent	Grade	#	percent
A	14	8.9 %	A	39	22.5 %	A	30	17.1 %	A	34	18.8 %
A-	15	9.6 %	A-	48	27.8 %	A-	26	14.8 %	A-	14	7.7 %
B+	20	12.7%	B+	11	6.4 %	B+	22	12.5 %	B+	22	12.2 %
B	25	15.9 %	B	7	4.0 %	B	23	13.1 %	B	27	14.9 %
B-	18	11.5 %	B-	13	7.5 %	B-	2	1.1 %	B-	18	9.9 %
C+	18	11.5 %	C+	29	16.8 %	C+	24	13.6 %	C+	37	20.4 %
C	19	12.1 %	C	19	11.0 %	C	31	17.6 %	C	16	8.8 %
C-	8	5.1 %	C-	1	0.6 %	C-	8	4.6 %	C-	5	2.8 %
D+	8	5.1 %	D+	1	0.6 %	D+	4	2.3 %	D+	5	2.8 %
D	3	1.9 %	D	2	1.2 %	D	5	2.8 %	D	1	0.6 %
D-	4	2.6 %	D-	1	0.6 %	D-	1	0.6 %	D-	2	1.1 %
F	5	3.2 %	F	2	1.2 %	F	0	0.0 %	F	0	0.0 %
Total	157	100.0%	Total	173	100.0 %	Total	176	100.0%	Total	181	100.0%

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**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.

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**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:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

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**Copyright Notice.** All handouts used in this course are copyrighted and may not be copied without my expressly granted permission. "Handouts" include all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, problems, in-class materials, review sheets, problem sets, or other materials. Tutors and tutoring services are expressly forbidden from copying any or all of these materials, unless you pay me one million U.S Dollars. Only students currently enrolled in the class may make a single copy of this material for their personal use.

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