Organic Chemistry 2 for Majors – CHM 2213 Syllabus

Version 2

CHM 2213–1297, Class #11038, **Spring 2019**, Monday, Wednesday, Friday, 10:40 am – 11:30 am
Classroom: 207 Leigh Hall

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

Course Description. The second half of the CHM 2212/2213 sequence for chemistry majors. A study of structures, synthesis and reactions of organic compounds, with emphasis on mechanism and spectroscopy.
Prerequisites. CHM 2212 or the equivalent; chemistry majors (CY or CY BIO) only.

1	January 7	**15.1–15.7**	Infrared (IR) Spectroscopy, Signal Characteristics, Spectral Analysis
2	January 9	**15.8–15.16**	Mass Spectrometry, Fragmentation, Fragment Analysis, Hydrogen Deficiency Index
3	January 11	**16.1–16.4**	NMR Spectroscopy, ^{1}H NMR Spectra, Characteristics, Number of Signals •PS#15
4	January 14	**16.5–16.7**	NMR Chemical Shift, Integration, Multiplicity, Splitting
5	January 16	**16.8–16.12**	Drawing ^{1}H NMR Spectra, Spectral Analysis, ^{13}C NMR Spectra
6	January 18	**17.1–17.6**	Conjugated Dienes, MO Theory, Electrophilic Addition, Pericyclic Reactions •PS#16
	January 21	**Holiday**	MLK Jr. Day
7	January 23	**17.7–17.9**	Diels-Alder Reactions, MO of Cycloadditions, Electrocyclic Reactions
8	January 25	**17.10–17.13**	Sigmatropic Rearrangements, UV-Vis, Color, Vision
9	January 28	**18.1–18.4**	Aromatic Compounds, Nomenclature, Benzene, Stability of Benzene •PS#17
10	January 30	**18.5–18.8**	Other Aromatics, Heterocycles, Benzylic Reactions, Reduction, Spectroscopy •PS#18
11	February 1		**Midterm Examination I** (Chapters 15–18)
12	February 4	**19.1–19.4**	Electrophilic Aromatic Substitution, Halogenation, Sulfonation, Nitration
13	February 6	**19.5–19.7**	Friedel-Crafts, Activating Groups
14	February 8	**19.8–19.11**	Deactivating Groups, Halogens, Directing Effects, Multiple Substituents
15	February 11	**19.12–19.15**	Synthesis, Nucleophilic Aromatic Substitution, Elimination-Addition, Mechanism
16	February 13	**20.1–20.4**	Aldehydes & Ketones, Nomenclature, Preparation, Nucleophilic Additions
17	February 15	**20.5–20.9**	Oxygen & Nitrogen Nucleophiles, Hydrolysis, Sulfur & Hydrogen Nucleophiles •PS#19
18	February 18 T	**20.10**	Carbon Nucleophiles
19	February 20	**20.11–20.13**	Oxidation, Synthesis, Spectroscopy
20	February 22	**21.1–21.5**	Carboxylic Acids, Nomenclature, Structure & Properties, Preparation, Reactions •PS#20
21	February 25	**21.6–21.7**	Carboxylic Acid Derivatives, Reactivity
22	February 27	**21.8–21.11**	Acid Chlorides, Acid Anhydrides, Esters Preparation, Reactions of Esters
23	March 1	**21.12–21.15**	Amides, Nitriles, Synthesis, Spectroscopy •PS#21
	March 4	**Holiday**	Spring Break
	March 6	**Holiday**	Spring Break
	March 8	**Holiday**	Spring Break
24	March 11		**Midterm Examination II** (Chapters 19–21)
25	March 13	**22.1–22.3**	Alpha Carbon Chemistry, Enols & Enolates, Alpha Halogenation, Aldol Reactions
26	March 15	**22.4–22.5**	Claisen Condensations, Alpha Alkylation
27	March 18	**22.6–22.7**	Conjugate Addition, Synthesis
28	March 20 T	**23.1–23.2**	Amines, Nomenclature •PS#22
29	March 22	**23.3–23.6**	Properties, Preparation, Amines via Substitution, via Reductive Amination
30	March 25	**23.7–23.10**	Amine Synthesis, Acylation, Elimination, Nitrous Acid,
31	March 27	**23.11–23.13**	Aryldiazonium Ions, Nitrogen Heterocycles, Spectroscopy
32	March 29	**24.1–24.5**	Carbohydrates, Monosaccharides, Aldoses, Ketoses, Cyclic Monosaccharides •PS#23
33	April 1 T	**24.7**	Disaccharides
34	April 3	**24.6**	Reactions of Monosaccharides
35	April 5	**24.8–24.10**	Polysaccharides, Amino Sugars, *N*-Glycosides
36	April 8	**25.1–25.3**	Amino Acids, Peptides, Proteins, Amino Acid Structure & Properties, Synthesis •PS#24
37	April 10	**25.4–25.8**	Peptide Structure, Sequencing, Synthesis, Protein Structure & Function •PS#25
38	April 12		**Midterm Examination III** (Chapters 22–25)
39	April 15	**26.1–26.4**	Lipids, Waxes, Triglycerides, Reactions of Triglycerides
40	April 17	**26.5–26.8**	Phospholipids, Steroids, Prostaglandins, Terpenes
41	April 19	**27.1–27.3**	Synthetic Polymers, Nomenclature, Copolymers •PS#26
42	April 22	**27.4–27.5**	Polymers by Reaction Type, by Mode of Assembly
43	April 24	**27.6–27.8**	Polymers by Structure, by Properties, Recycling •PS#27
44	May 2	**Final Exam**	(Chapters 15–27) Thursday, 10:00 am – 12:00 noon, LEI 207

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

Required Textbook: David Klein. ***Organic Chemistry****, Second Edition*; Wiley, **2015**. (ISBN 1118452283) https://www.amazon.com/Organic-Chemistry-2nd-David-Klein/dp/1118452283

Required Student Study Guide: David Klein. ***Student Study Guide and Solutions Manual to accompany Organic Chemistry****, Second Edition*; Wiley, **2015**. (ISBN 1118647955)
https://www.amazon.com/Student-Solutions-accompany-Organic-Chemistry/dp/1118647955

Publisher's Sales Website: https://www.wiley.com/en-us/Organic+Chemistry%2C+2nd+Edition-p-9781118795712

WileyPLUS Website: https://www.wileyplus.com/WileyCDA/ class # 529975

Highly Recommended Model Sets: 1003A/Organic Chemistry Basic Set
https://www.amazon.com/1003A-Organic-Chemistry-Basic-Set/dp/4902897563
http://www.maruzen.info/hgs/catalog/product_info.php?products_id=4 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: Brown, Iverson, Anslyn, & Foote; Wade; McMurry; Vollhardt & Schore; Morrison & Boyd; Bruice; Hornback; Streitwieser & Heathcock.

Canvas Website. All students will have access to the 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) Thirteen problem sets (20 points each; 240 points max; the lowest score will be dropped)
2) Six in-class quizzes (10 points each = 60 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 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 Canvas. The lowest of the thirteen 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 six 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 on Canvas (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. If you find 340 empty, please find Dr. Miller in his regular office (LEI 318A). Additional office hours are planned for **Tuesdays from 2:00 pm – 2:50 pm** and **Fridays from 1:00 pm – 1:50 pm**, also in **Sisler Hall 340**, by undergraduates who have previously completed my 2212/2213 sequence. Additionally, students are encouraged to visit the Organic Chemistry Learning Center, located in JHH 205. 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 Canvas.

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. If for some reason you take an exam late, do not download or otherwise view the posted exam or exam key, or consult any classmates about exam content. Any such downloading or consultation will result in a zero for the exam.

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

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.

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 nine 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%

Spring 2016:

Grade	#	percent
A	34	18.8 %
A-	14	7.7 %
B+	22	12.2 %
B	27	14.9 %
B-	18	9.9 %
C+	37	20.4 %
C	16	8.8 %
C-	5	2.8 %
D+	5	2.8 %
D	1	0.6 %
D-	2	1.1 %
F	0	0.0 %
Total	181	100.0%

Fall 2016 (CHM 2212):

Grade	#	percent
A	14	34.1 %
A-	5	12.2 %
B+	3	7.3%
B	11	26.8 %
B-	1	2.3 %
C+	4	9.8 %
C	0	0.0 %
C-	0	0.0 %
D+	0	0.0 %
D	1	2.4 %
D-	1	2.4 %
F	1	2.4 %
Total	41	100.0%

Spring 2017 (CHM 2213):

Grade	#	percent
A	7	18.4 %
A-	7	18.4 %
B+	5	13.2 %
B	10	26.3 %
B-	3	7.9 %
C+	4	10.5 %
C	1	2.6 %
C-	0	0.0 %
D+	0	0.0 %
D	0	0.0 %
D-	0	0.0 %
F	1	2.6 %
Total	38	100.0%

Summer 2017:

Grade	#	percent
A	13	25.0 %
A-	10	19.2 %
B+	4	7.7 %
B	3	5.8 %
B-	1	1.9 %
C+	13	25.0 %
C	2	3.9 %
C-	5	9.6 %
D+	1	1.9 %
D	0	0.0 %
D-	0	0.0 %
F	0	0.0 %
Total	52	100.0%

Fall 2017 (CHM 2212):

Grade	#	percent
A	10	26.3 %
A-	8	21.1 %
B+	8	21.1 %
B	3	7.9 %
B-	3	7.9 %
C+	4	10.5 %
C	0	0.0 %
C-	0	0.0 %
D+	0	0.0 %
D	1	2.6 %
D-	0	0.0 %
F	1	2.6 %
Total	38	100.0%

Spring 2018 (CHM 2213):

Grade	#	percent
A	10	26.3 %
A-	3	7.9 %
B+	6	15.8 %
B	6	15.8 %
B-	8	21.1 %
C+	1	2.6 %
C	1	2.6 %
C-	0	0.0 %
D+	0	0.0 %
D	0	0.0 %
D-	0	0.0 %
F	0	0.0 %
Total	35	100.0 %

Summer 2018:

Grade	#	percent
A	31	17.6 %
A-	26	14.8 %
B+	21	11.9%
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%

Fall 2018 (CHM 2212):

Grade	#	percent
A	10	27.0 %
A-	5	13.4 %
B+	7	18.9 %
B	5	13.5 %
B-	3	8.1 %
C+	4	10.8 %
C	2	5.4 %
C-	0	0.0 %
D+	0	0.0 %
D	1	2.7 %
D-	0	0.0 %
F	0	0.0 %
Total	27	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:
See: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

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