

CHEM 2451 ORGANIC CHEMISTRY

Syllabus for Winter Quarter 2016

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Office Hours: MWRF 10 – 11 AM in Olin 232 or by appointment

Required Text and Solutions Manual:

Organic Chemistry, 6th Edition, by Marc Loudon and Jim Parise
Study Guide and Solutions Manual to Accompany Organic Chemistry, 6th Edition
by Jim Parise and Marc Loudon

Recommended Model Kit:

Molymod #62053 Molecular Modeling Set from Indigo Instruments

Course Objective. Your primary course objective is to master the subject matter of the first quarter of the three-quarter course in organic chemistry. An understanding of organic chemistry is essential for mastery of subsequent undergraduate courses in biochemistry and physical chemistry and for achieving the high test scores necessary for admission to post-graduate or professional school. Your secondary course objective is to gain insight into the logical progression of scientific inquiry and scientific discovery. When the goals of undergraduate, post-graduate, and professional school are completed, this insight and an appreciation of organic chemistry in the world within and around you will help you make well-informed decisions in your chosen profession and as citizens, neighbors, parents, children, and patients.


“The purpose of education is to nurture thoughtfulness. The lesser function of thinking is to solve puzzles and problems.”

Albert Einstein

Lectures. The lectures will loosely follow the progression of the textbook at a pace of approximately one chapter per week. The lectures are presented on the board at a pace which should allow you to take notes and think critically about the material presented. I use four ink colors. I suggest you have four colors available to reproduce the material presented. Questions are welcome at any time during the lecture.

Problem/Help Sessions. Thursday problem-solving sessions provide an opportunity for you to test your command of the current lecture material.

Homework. Set aside time after every lecture to read the textbook, review your notes and complete textbook problems. Textbook problems relevant to each lecture are posted on Canvas. Some exam questions are taken from the textbook problems.

Homework Help. The Science and Engineering Learning Center (SEC), a collaborative space located in Anderson Academic Commons, is staffed by undergraduate and graduate learning assistants (LAs). **The mission of the SEC is to help students develop their problem solving skills by assisting with homework, exam preparation, and lab reports.** SEC is not a one-on-one tutoring center, but is rather a support system where students can work with the LAs and peers. SEC provides support for first and second year lecture courses in biology, chemistry, computer science, engineering, and physics and for laboratory courses in chemistry, engineering, and physics. SEC is open to all DU students and all services are free. See <http://portfolio.du.edu/sec> for a complete schedule. Follow on Twitter for the most up-to-date announcements:  **@SELCatDU**

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Exams and Grading. There will be two 50 minute exams and one 105 minute comprehensive final exam. Each exam is worth 200 points. If your lowest 50 minute exam score is lower than your final exam score, the 50 minute exam score will be replaced by the final exam score. There are no make-up exams. If you miss a 50 minute exam for any reason, the 0 for that exam will be replaced by the final exam score. Your final grade will be based on 620 points: 600 points for the exams and 20 points for completion of the online course evaluation at the end of the quarter. Your course grade will be determined using the following scale:

	A		B			C			D		
Letter	A	A-	B+	B	B-	C+	C	C-	D+	D	D-
%	92	88	84	80	76	72	68	64	60	56	52
Points	570	546	521	496	471	446	422	397	372	347	322

Grade Curve. The raw score class average for each exam is announced on Canvas. If the raw score class average is below 144 points (72% C+) your grade will be curved. To illustrate, if the raw score class average is 130, 14 points will be added to your raw exam score. Your curved exam score is posted on Canvas. The maximum curved exam score is 200 points.

Exam Review/Corrections. Answer keys are posted on Canvas for each exam. The exam answer key is usually reviewed point-by-point during the recitation after the exams are returned. Grading corrections on exams 1 and 2 should be submitted for review within two weeks after the answer key is reviewed. Grading corrections on the final exam should be submitted for review within the first two weeks of the next quarter.

Graded Document Retention. All graded materials will be returned. Graded materials still in my possession at the end of Spring Quarter 2016 will be shredded and recycled.

Cell Phones, Laptops, and Calculators in the Classroom. Turn off cell phones during class. Laptops are permitted during lecture and recommended during problem sessions. Cell phones, laptops, and calculators must be turned off and put away during exams.

Lecture and Testing Accommodations. If you have a disability/medical issue protected under the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act and need to request accommodations, please make an appointment with the **Disability Services Program** (DSP); 303.871.2372/ 2278/ 7432; located on the 4th floor of Ruffatto Hall; 1999 E. Evans Ave. Information is also available on line at <http://www.du.edu/disability/dsp>. See the *Handbook for Students with Disabilities*.

Honor Code of the University of Denver. To review your rights and responsibilities with respect to the Honor Code of the University of Denver, visit the website for the Office of Student Conduct at: www.du.edu/honorcode

I reserve the right to modify the syllabus and lecture schedule as necessary.

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Tentative Lecture Schedule

4 January	Introductions/Syllabus Lewis Dot Structures VSEPR Theory Resonance Structures/Hybridization Polarity of Bonds and Molecules Molecular Orbital Theory	Chapter 1 pp. 1 – 44
6	Continued	
8	Continued	
11	Continued	
13	Nomenclature Alkanes and Cycloalkanes Boiling Point/Melting Point/Solubility Intermolecular Attractive Forces Bond Rotation/Newman Projections Torsional and Steric Strain	Chapter 2 pp. 45 – 86
15	Continued	
18	NO CLASSES MLK Day	
20	Continued	
22	Continued	
25	Lewis and Bronsted Acids and Bases Ka and pKa Arrows for Reactions/Resonance Predicting Acidity/Basicity Kinetics and Thermodynamics	Chapter 3 pp. 87 – 124
27	Continued	
29	Alkene Structure and Bonding Stereoisomerism Nomenclature Alkenes/Cycloalkenes Addition of H ₂ Heats of Formation and Hydrogenation Alkene Stability Order Addition HX and H ₂ O/HA Markovnikov's Rule Carbocation Stability/Rearrangement Energy Diagrams/Hammond's Postulate	Chapter 4 pp. 125 – 180
1 February	Continued	
3	EXAM 1 Chapters 1 – 3	
5	Chapter 4 Continued	
8	Continued	

10	Radical Chain Mechanism for HBr Radical Stability Order Addition of X_2 and X_2/H_2O Oxymercuration/Reduction Hydroboration/Oxidation	Chapter 5 pp. 181 – 228
12	Continued	
15	Continued	
17	Enantiomers/Asymmetric Carbons Plane of Symmetry Nomenclature Enantiomers Polarimetry/Optical Rotation Diastereomers/Meso Compounds	Chapter 6 pp. 229 – 271
19	Continued	
22	Cycloalkanes: Torsional and Angle Strain Cyclohexane Chair/Boat Conformations Axial and Equatorial/1,3-Diaxial Strain Cyclohexanes with Two Substituents Bicyclic/Spirocyclic Compounds Stereochemistry as Tool for Mechanisms	Chapter 7 pp. 272 – 323
24	Continued	
26	Continued	
29	Continued	
2 March	Exam 2 Chapters 4 – 7	
4	Nomenclature Alkyl Halides/Alcohols/ Thiols/Ethers/Sulfides on 3/5 Bronsted Acidity and Basicity Grignard and Organolithium Reagents Alkane Free Radical Halogenation	Chapter 8 pp. 324 – 381
7	S_N2 Kinetics/Mechanism Alkyl Halide α and β substitution Nucleophilicity Basicity/Size/Solvation	Chapter 9 pp. 382 – 405
9	Continued	
10-13	FINAL EXAM comprehensive date/time on Web Central	