

**Chemical Systems I
CHEM 3110 Section 1
Winter Quarter 2022**



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Lecture: MWF 10:00 – 10:50 AM, Olin 103

Required Text: *Modern Physical Organic Chemistry*, Anslyn & Dougherty

Course Objectives: In this course we will broadly be covering the fields of advanced organic chemistry and physical organic chemistry. It is my hope that because of this course you will understand the nature of the chemical bond, the logical flow of electrons, how to analyze reaction kinetics, how thermodynamic and kinetic parameters impact reactions, the basic concepts of catalysis, and the fundamentals of addition, elimination, and substitution reactions. An additional project will be related to concepts covered in class but are mainly geared towards aiding in your development as successful researchers.

Point Structure:

Problem Sets: 100 points (4 total, 25 points each)

Project: 100 points (1 total, midterm)

Final Exam: 100 points (1 total, final)

Problem Sets: You will be given 4 take home assignments throughout the duration of this course that will aide and test your comprehension of concepts covered in lecture. These assignments can be done in groups and are due by 5 pm on specified due dates.

Project/Midterm: As opposed to a written midterm examination, I will be assigning a project as a replacement. This project will be done individually and will be a 3-page review written in the format of *Accounts of Chemical Research*. As part of this project, you will be assigned 3-4 papers from the primary literature on a singular subject broadly related to Physical Organic Chemistry. From these papers and whatever other literature you deem relevant, you will write a 3 page mini-review consisting of, *at a minimum*: 1) a title, 2) an abstract, 3) a TOC figure, 4) a minimum of 3 original figures, 5) a written introduction, 6) a summary of the literature, 7) a conclusion, and 8) a minimum of 10 citations in ACS format. We will discuss this project at length during this course and I will be available to help everyone create a strong, independent, and cogent mini-review of the provided literature. A template will be provided and will be strictly adhered to. *Everything in this mini-review should be in your own voice and all pictures/figures should be your own, plagiarized text or figures will result in a 0 on this project.*

Final Examination: A final exam covering all core concepts and materials from week 1 to 9 will be given in week 10 of this course. The student will find it most instructive to study materials covered on problem sets, class notes, and supplementary notes.

Final Grade: Your final grade will be determined out of the 300 available points obtained through problem sets, the project, and the final exam. This class will be curved by setting the highest grade in the course as 100% and adding the difference between this score and the total available points (300) to the other scores. Although, in class/out of class engagement, attendance, and general participation *do not directly impact your final grade*, they will be considered in the case of borderline scenarios. Therefore, it is in your best interest as a student to be engaged, in attendance, and an active participant in discussions.

Cell phone and electronic device policy: While in class please have your cell phone on silent and please refrain from texting/use of cell phone during lecture. Of course, situations and emergencies arise, if you need to take a call or use your cell, I recommend that you quietly leave the class to do so. Laptops or tablets are allowed in class for notetaking purposes.

Lecture and testing accommodations: I will make every effort to accommodate students with a learning disability. If you require special accommodations to be made, please email me at any time during the class (preferably within the first week). For further information, please see the University's Disability Services' website at: <http://www.du.edu/disability/dsp/index.html>. I am a very slow test taker and found time provided for testing to be insufficient and stressful. Therefore, I will not put a strict time limit on examinations. You can take as long as you need and, within reason, you will be accommodated. All quizzes and tests will be open book, open note. I hope for examination components of this course to test your comprehension of the material not your test taking ability.

Academic Integrity: I advocate for collaborative learning and teamwork, but I hope that each student will maintain high ethical standards. As such, I will support and enforce the Honor Code of the University of Denver: www.du.edu/honorcode

My commitment: It is my job to teach the students of this course the subject materials to the best of my ability. As such, *I am **your** employee*. Therefore, day or night, please contact me directly if you need help or need special accommodations. You are *never* bugging me.

You read this syllabus?: Send me an email (brady.worrell@gmail.com) with "4n+2" in the title of the email and I will give you 10 extra bonus points.

Topics to be covered:

Week	Lecture	Topic	Readings
1	1 (1/3)	Chapter 1: Structure and Bonding	pg 3 – 10 (1.1.1-1.1.6)
	2 (1/5)		pg 10 – 25 (1.1.7-1.1.12)
	3 (1/7)		pg 52 – 59 (1.4)
2		Continue Chapter 1 Problem Set #1 posted 1/12, due 1/19	See above
3	4 (1/17)	Chapter 2: Strain and Stability	pg 65 – 82 (2.1)
	5 (1/19)		pg 82 – 100 (2.2-2.3.1)
	6 (1/21)		pg 100 – 124 (2.3.2-2.4)
4	9 (1/24)	Continue Chapter 2	See above
	10 (1/26)		
	11 (1/28)		Canvas Handouts
5	12 (1/31)	Chapter 6: Stereochemistry Problem Set #2 posted 1/24, due 1/31	pg 297 – 314 (6.1-6.2)
	13 (2/2)		pg 315 – 322 pg 333 – 340 (6.3-6.5, 6.8)
	14 (2/4)		Mini-Review Workshop #1
6	15 (2/7)	Chapter 7: Kinetic analysis	pg 355 – 374 (7.1-7.2)
	16 (2/9)		pg 374 – 382 (7.3)
	17 (2/11)		pg 382 – 390 (7.4)
7	18 (2/14)	Chapter 8: Thermodynamics and Kinetics Problem Set #3 posted 2/7, due 2/14 Rough draft of mini-review due 2/11	pg 421 – 434 (8.1.1-8.1.4)
	17 (2/16)		pg 441 – 463 (8.2-8.4.5)
	18 (2/18)		pg 466 – 479 (8.6-8.8.8)
8	19 (2/21)	ChemDraw Workshop Mini-Review Workshop #2 Mini-Review due (No class)	
	20 (2/23)		
	21 (2/25)		
9	22 (2/28)	Chapter 10: Additions and Eliminations Problem Set #4 posted 2/21, due 2/28	pg 537 – 554 (10.1-10.5)
	23 (3/2)		pg 554 -569 (10.6-10.9)
	24 (3/4)		pg 581-595 (10.13)
10	25 (3/7)	Chapter 11: Substitution	pg 627 – 636 (11.1-11.4)
	26 (3/9)		pg 637 – 646 (11.5.1-11.5.8)
	27 (3/11)		pg 668 – 683 (11.6-11.10)
11	28 (3/14)	Continue Chapter 11, as needed	
	(3/16)	No class	
	(3/18)	Final exam	

Key for student deliverables:

Red: Deliverables - Problem Sets (4 total, 25 pts each, 100 pts), Mini-Review (1 total, 100 pts). Due dates are by 5 pm on day specified.

Blue: Examinations (1 total, 100 pts).

Purple: Rough draft (1 total, -50 pts if not turned in).

Green: Review sessions or special topics (no points, not covered on examinations, attendance optional but recommended).