

# CHEM 2410/CHEM 2420 Organic Chemistry I and II Summer 2022 Syllabus

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Organic chemistry is notorious for being a difficult and seemingly impossible course for students, and it has been my goal to dispel that stigma ever since I started teaching. This course will emphasize problem solving and understanding over memorization. The key to organic chemistry is being able to take a concept and apply it to something that you may not have seen before. Here are a few tips. First, write down questions on things you do not understand. Sometimes it will seem like nothing makes sense but try to write down at least one question. Second, get your questions answered. As you get your one question answered, you may have follow-up questions. Get those answered as well to build a foundation. I stop after nearly every slide in class to ask if there are questions, and I hold many office hours outside of class. I try to be accessible so students can get the help they need. Third, study regularly and do practice problems. This one is difficult because you have other classes, so I have designed my homework assignments to be spread out to hopefully help you be exposed to the material regularly. As you are studying, do not focus on the outcome of a specific example, but focus on finding a pattern that can be applied to many examples. This will help you recognize how reactions proceed or how certain rules work because there is always a pattern. Most of all, utilize my expertise because I am here to help, and I want all of you to succeed.

In CHEM 2410, we will focus on fundamentals of organic compounds and the unique properties they have. After introducing some foundational concepts, the course will transition to chemical reactions, which makes up much of organic chemistry. Synthetic organic chemists focus on building complex molecules from simpler ones. Organic reactions are diverse and can be used to do many things, ranging from making drug compounds to making materials for clothing. I will end CHEM 2410 by with the introduction of analytical techniques for identifying organic molecules.

In CHEM 2420, the course will start with the continuation of analytical techniques and shift back to learning about reactions with various functional groups. Some reactions will be familiar, and many will be new, but the objective will be to build upon what you already learned. The end of the semester will start delving into biochemistry. The last chapter will take some of the reactions you learned throughout both semesters and apply them in a biological context.

## Office hours

I will hold office hours during class times on days we do not have problem solving sessions. I am also more than happy to stay after class or schedule appointments to answer any questions.

## Prerequisite

The prerequisite for CHEM 2410 is successful completion of CHEM 1012/1022. (CHEM 101/102)

The prerequisite for CHEM 2420 is successful completion of CHEM 2410.

## Learning objectives for CHEM 2410

Students will learn foundations of organic chemistry, including the fundamental rules of organic bond formation; the physical properties associated with structure of compounds; Nomenclature and the identification of organic functional groups; reactions of alkanes, alkyl halides, and alcohols; Substitution and elimination reactions and mechanisms; the differences in energies of isomers and conformers; the foundations of stereochemistry and the differences in properties of stereoisomers; Properties and reactions of alkenes, alkynes, the use of electromagnetic radiation to probe the structure of organic compounds. Demonstration of mastery of these objectives will be assessed through problem sets, collaborative discussions, and weekly tests.

## Learning objectives for CHEM 2420

Students will continue to learn the foundations of organic chemistry, including the nomenclature and the identification of organic functional groups; the physical properties associated with structure of compounds; reactions, and associated mechanisms, of conjugated systems, aromatic compounds, ethers, ketones, aldehydes, carboxylic acids, and carboxylic acid derivatives; the differences in energies of isomers and conformers; the fundamentals of conjugated alkene and aromatic compound properties and reactions; the construction and use of molecular orbital diagrams to analyze reaction spontaneity and compound stability; introduction to the major classes of biological molecules as a preparation for more advanced chemistry and biology courses. Demonstration of mastery of these objectives will be assessed through problem sets, collaborative discussions, and weekly tests.

## Communication

Email is the best method to contact me. Please write your emails in a professional manner with a proper subject, heading, body, and sign off with your name. Allow me 24-hours to get back to you. Sometimes responses will be immediate, but other times I may be busy or need to do some research to find an appropriate response.

## Texts and supplies

The textbook is Organic Chemistry, 9<sup>th</sup> edition by Leroy Wade and Jan Simek; Pearson Mastering Chemistry subscription for homework assignments and extra practice problems.

## Highly Recommended

**Molecular model kit:** One of the main aspects of organic chemistry is looking at the three-dimensional nature of molecules, but it is difficult to imagine a 3D molecule when it is drawn on the 2D surface of paper. The molecular models will help you to visualize the molecules and look at interactions that would not be obvious on a drawing.

## The components of your CHEM 2410 score

Course component	Points	Total
Online Homework	10 points each x 12 (Through Mastering Chemistry)	120
Discussion problem sets	10 pts each x 10 (Collaborative discussion problem sets)	100
Weekly Tests	130 points x 6 (Open-book, free response)	780
Course Total		1000

## The components of your CHEM 2420 score

Course component	Points	Total
Online Homework	10 points each x 11 (Through Mastering Chemistry)	110
Discussion problem sets	12 pts each x 10 (Collaborative worksheets)	120
Weekly Tests	147 points x 4 + 182 points (Open-book, free response)	770
Course Total		1000

## Lectures (Asynchronous)

Lectures will be pre-recorded and posted to Canvas on a weekly basis. Each chapter will be broken down into pieces to make viewing easier. Lecture recordings must be viewed prior to coming class.

## Problem Solving Sessions Monday-Thursday 8:30 am – 9:30 am

After being introduced to the material through the recorded lectures, we will practice problems solving and hone study skills in class for the first hour. Problem solving sessions will be held in person and focus on applying the material. This is the perfect time to get questions answered and clarify any confusions with the material.

## Discussion Problem Sets Monday-Thursday 9:30 am – 10:15 am

Discussion problem sets will be posted after the problem solving sessions and students will work on them in groups of three or four. Groups can be formed on your own or assigned. These problem sets are meant to be collaborative. Feel free to ask questions, use your notes, textbook, and the internet. I will walk around the classroom to provide guidance. This will be submitted through Canvas and must be submitted as a PDF. Only one submission is needed per group.

## Weekly Tests Fridays 8:30 am – 10:15 am

**CHEM 2410:** Weekly tests will be held on Friday during regularly scheduled class times (8:30 am – 10:15 am) and cover material learned during the week. Weekly tests are worth 130 points each. Tests will cover two chapters worth of material, and questions will be entirely free response. You will be given 75 minutes to complete each test.

**CHEM 2420:** Weekly tests will be held on Friday during regularly scheduled class times (8:30 am – 10:15 am) and cover material learned during the week. Four of the tests are worth 147 points each and cover two chapters of material each. There will be a larger test covering three chapters of material and be worth 182 points. The questions will be entirely free response. You will have 85 minutes to complete the 147-point tests and 100 minutes to complete the 182-point test.

There are no re-tests, and no tests are dropped. Under extenuating circumstances, such as illness, you can reschedule one class test with appropriate documentation. Documentation and notice that you need to reschedule must be given

**before the original exam time.** If you will be missing a test for religious reasons, I can reschedule the test to an alternate time. This must be done at the **beginning of the semester.**

### Online Homework (Asynchronous)

Homework assignments will be accessible through Mastering Chemistry by Pearson. There are 12 assignments for CHEM 2410 and 11 assignments for CHEM 2420. Each assignment is worth 10 points. There are more than 10 points on each assignment to allow for leeway. You only need to earn 10 points on each assignment to get full credit. I recommend doing all the problems to get more practice. There are no dropped homework assignments. Late assignments are subject to 20% penalty per day late. In most cases, you can submit a homework assignment one day late and still get full credit. If you get stuck, I am happy to help during office hours.

### Grade cut-offs for CHEM 2410 and CHEM 2420 course totals

Total points range	Letter grade		Total points range	Letter grade
$940 \leq \text{score}$	A		$690 \leq \text{score} < 740$	C+
$890 \leq \text{score} < 940$	A-		$640 \leq \text{score} < 690$	C
$840 \leq \text{score} < 890$	B+		$590 \leq \text{score} < 640$	C-
$790 \leq \text{score} < 840$	B		$540 \leq \text{score} < 590$	D
$740 \leq \text{score} < 790$	B-		$540 < \text{score}$	F

### Regrade Policy

If your answer appears like the test key but it was marked incorrect, you may turn it in for a regrade. Make sure to carefully compare the key to your answer before submitting a regrade. This process is not to dispute grading schemes of exam questions, but to correct any potential mistakes in grading. The deadline for receipt of regrades is 1 week from the exam key posting date. Submit questions for regrade by emailing me with your name, the exam being regraded, and a list of the problems that you want re-graded. **Emails that do not list specific questions or say 'regrade entire exam' will not be regraded.**

### Support for Students

If you are experiencing undue personal or academic stress at any time during the semester or need to talk with someone about a personal problem or situation, I encourage you to seek support as soon as possible. I am available to talk with you about stresses related to your work in my class. Additionally, other university resources that can be found [here](#).

### Disability-related Equal Access Accommodations

University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by [Student Disabilities Services](#) (SDS). If you have not yet contacted SDS and would like to request accommodations or have questions, you can make an appointment by calling SDS at 215-573-9235. The office is located in the [Weingarten Learning Resources Center](#) at Stouffer Commons 3702 Spruce Street, Suite 300. All services are confidential.

### Academic Integrity

University of Pennsylvania provides explicit guidelines in the [Code of Academic Integrity](#). Unless specified otherwise in the syllabus, I expect the work you submit for grading to be yours and yours alone. Not acknowledging another's work with proper references, taking credit for someone else's work, letting your work appear in another student's paper, fabricating "results", or using unapproved resources during assessments are grounds for failing the course. If you have any questions about what constitutes plagiarism or cheating, please ask me.

### Important dates

	CHEM 2410	CHEM 2420
Add/drop deadline with no financial obligation	Tuesday, May 31 <sup>st</sup> , 2022	Thursday, July 7 <sup>th</sup> , 2022
Last day to drop a class (50% financial obligation)	Wednesday, June 8 <sup>th</sup> , 2022	Friday, July 15 <sup>th</sup> , 2022
Grade type change deadline	Wednesday, June 8 <sup>th</sup> , 2022	Friday, July 15 <sup>th</sup> , 2022
Withdrawal deadline	Wednesday, June 22 <sup>nd</sup> , 2022	Friday, July 29 <sup>th</sup> , 2022

Course Schedule

CHEM 2410

May

M	T	W	R	F	S	Su
23: Introduction	24: Ch 1 Problem Solving	25: Ch 2 Problem Solving	26	27: Test 1 (Ch 1 and 2)	28	29: Ch 1 and 2 HW due
30: No class	31: Ch 3 Problem Solving					

June

M	T	W	R	F	S	Su
		1: Ch 4 Problem Solving	2	3: Test 2 (Ch 3 and 4)	4	5: Ch 3 and 4 HW due
6: Ch 5 Problem Solving	7	8: Ch 6 Problem Solving	9	10: Test 3 (Ch 5 and 6)	11	12: Ch 5 and 6 HW due
13: Ch 7 Problem Solving	14: Ch 8 Problem Solving	15	16: Ch 9 Problem Solving	17: Test 4 (Ch 7 and 8)	18	19: Ch 7 and 8 HW due
20: No class	21: Ch 10 Problem Solving	22	23: Ch 11 Problem Solving	24: Test 5 (Ch 9 and 10)	25	26: Ch 9 and 10 HW due
27: Ch 12 Problem Solving	28	29: Test 6 (Ch 11 and 12) Ch 11 and 12 HW due				

CHEM 2420

June + July

M	T	W	R	F	S	Su
			30: Introduction	1: Ch 13 Problem Solving	2	3
4: No class	5: Ch 14 Problem Solving	6	7: Ch 15 Problem Solving	8: Test 1 (Ch 13 and 14)	9	10: Ch 13 and 14 HW due
11: Ch 16 Problem Solving	12:	13: Ch 17 Problem Solving	14	15: Test 2 (Ch 15, 16, and 17)	16	17: Ch 15, 16, and 17 HW due
18: Ch 18 Problem Solving	19	20: Ch 19 Problem Solving	21	22: Test 3 (Ch 18 and 19)	23	24: Ch 18 and 19 HW due
25: Ch 20 Problem Solving	26	27: Ch 21 Problem Solving	28	29: Test 4 (Ch 20 and 21)	30	31: Ch 20 and 21 HW due

August

M	T	W	R	F	S	Su
1: Ch 22 Problem Solving	2	3: Ch 23 Problem Solving	4	5: Test 5 (Ch 22 and 23) Ch 22 and 23 HW due		