

Organic Chemistry II
Chemistry 3521
Fall 2021

Instructor: Prof. Ryan Murelli

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Course Time: Mondays, 9:30-10:55 (Zoom)*

Office Hours: Monday from 8-9 and Wednesday from 9:30-11:30 (Zoom)*

**Zoom links will be provided in advance of each office hour and lecture via Blackboard, usually the morning of.*

Course Description:

Organic chemistry is a required class for so many related fields of study because it requires a student to: 1) think about structures in 3-dimensions, and 2) analyze data using his/her understanding of basic principles to solve a problem. Think about it: the skills you use to propose a structure for an unknown compound from a set of ¹H NMR peaks are the same skills you will use to diagnose a patient with an unknown illness from a set of symptoms. This course, in conjunction with Chemistry 3511, will provide students with an introduction to organic chemistry concepts. Specifically, this course will cover organic reactions, mechanisms and principles that are relevant to many other sciences and that provide us with a greater understanding of how the natural world works. The prerequisite for this course is Chemistry 51 or Chemistry 3510 or Chemistry 3511 and 3512; Chemistry 3522 is a prerequisite or corequisite.

Course Objectives:

Upon completion of the course, students should be able to:

- Explain and/or apply selected fundamental principles of organic chemistry
- Provide reactants, reaction conditions, or reaction products for certain key reactions
- Illustrate the mechanism of certain key reactions
- Explain concepts such as stereoselectivity or regioselectivity for complex chemical reactions

Required Texts and Materials

Brown, Foote, Iverson, and Anslyl, *Organic Chemistry*. 8th ed. Belmont, CA: Brooks/Cole Cengage Learning, 2017. (Other additions are fine as are other books that are meant for undergraduate Organic Chemistry I and II. Just pay attention to the material we cover in class and make sure that it matches what you are reading, and if needed, supplement with online searches)

Recommended Materials.

Molecular Model Set for Organic Chemistry, Prentice Hall

Course Evaluation:

Homework Assignments: 15%

Quiz Grade: 15% (Average of top 4/5 quizzes)*

Lecture Exams: 40% (Average top 2/3 Mid-terms)**

Final Exam: 35%***

***Missed Quizzes:** There will be no makeup quizzes. There will be 5 quizzes throughout the semester, and your grade will be based on the top 4 scores. If for some reason you miss 2 quizzes, contact me.

**** Missed MidTerm Exams:** No makeups will be given for the midterms, and if you miss the exam it will count as your dropped exam. If you miss two of the three midterms with a valid excuse, your grade will be weighted based on your completed assignments as I see fit based upon the circumstances. Without an excuse, you will get a 0. Hopefully no one will miss all 3 midterms.

***** Missed Final Exams:** In the event of an excused absence from the final exam, you will need to take a makeup exam during an assigned time set by the chemistry department the following semester. Please talk with Prof. Murelli for details if you miss the final.

Assigning Letter Grades for Exams and for the Course: I do not have a formal curve for the course. Quiz averages are more in line with standard numerical/letter grade systems (ie, 90-100 = ~A, 80-90 +~B, etc.), but exams are typically lower (ie, 85-100 = ~A, 70-85 = ~B, 55-70 = ~C). I will provide an approximate letter grade breakdown after each exam.

Policy for Regrades: All examinations will be done online, and thus there should be no student-specific regrade requests. If a mistake is identified with the quiz, homework, or exam, students will be notified via blackboard and grades will be updated for all students accordingly.

University Policy of Academic Integrity: The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: <http://www.brooklyn.cuny.edu/bc/policies>. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Key Dates:

Homework Due at Midnight on following dates:

9/5 - HW1
9/12 - HW2
9/19 - HW3
10/3 - HW4
10/24 - HW5
11/7 - HW6
11/21 - HW7
12/5 - HW 8
12/12 - HW9

Quiz Dates

9/13 - Quiz 1
9/20 - Quiz 2
10/25 - Quiz 3
11/22 - Quiz 4
12/6 - Quiz 5

Exam Dates

10/4 - Exam 1
11/8 - Exam 2
12/13 - Exam 3
12/20 - Final Exam (subject to change)

Tentative Schedule

Topic	Tentative Dates	Suggested Reading and Suggested Practice Problems from 8 th Edition, and Homework Due Date
Organic I Refresher	8/30 (Class)	You need to know the reactions in chapters 4-9 and 15, which were covered in Organic Chemistry I. <i>(HW1 Due Sunday, Sept 5th at Midnight)</i>
Reactions of Alcohols	8/30 (Class)	Chapter 10. Q. 10.25-10.28, 10.31, 10.32, 10.35, 10.36, 10.39, 10.43-10.45, 10.51, 10.52-10.56 <i>(HW2 Due Sunday, Sept 12th at Midnight)</i>
Quiz 1	9/13 (Class)	Topics: Organic I reaction refresher motivation quiz and alcohol chemistry.
Ethers, Epoxides and Sulfides	9/13 (Class)	Chapter 11. Q. 11.15, 11.20-11.24, 11.26, 11.30, 11.33, 11.34, 11.37

		<i>(HW3 Due Sunday, Sept 19th at Midnight)</i>
Aldehydes and Ketones	9/13 (Class)	Chapter 16. Q. 16.23-16.25, 16.27, 16.30-16.32, 16.39, 16.42, 16.45-16.47, 16.52, 16.55, 16.57, 16.60, 16.64, 16.74-16.77 <i>(HW3 Due Sunday, Sept 19th at Midnight)</i>
Quiz 2	9/20 (Class)	Topics: Ethers/Epoxydes/Aldehydes/Ketones
Carboxylic Acids and Derivatives	9/20 (Class)	Chapters 17 and 18. Q. 17.18, 17.19, 17.22, 17.32, 17.39-17.42, 17.47-17.50, 18.26, 18.27, 18.32, 18.37, 18.38, 18.40, 18.63-18.67 <i>(HW4 Due Sunday, Oct. 3rd at Midnight)</i>
Enolates and Enamines	9/27 (Class)	Chapter 19. 19.18-19.21, 19.24, 19.26, 19.35, 19.37, 19.39, 19.41, 19.43, 19.47, 19.50, 19.55, 19.57, 19.64, 19.74-19.79 <i>(HW4 Due Sunday, Oct. 3rd at Midnight)</i>
Exam 1	10/4 (Class)	Topics: Reactions of Alcohols, Carbonyls, Enolates, and Enamines
Aromaticity, and Reactions of Benzene	10/18 (Class)	Chapters 21 and 22 Q. 21.11, 21.14-21.16, 21.18, 21.33-21.36, 21.45, 21.47, 21.50, 21.55, 21.65, 2.7, 22.20-22.24, 22.28, 22.43, 22.44, 22.48, 22.53, 22.61-22.63 <i>(HW5 Due Sunday, Oct. 24th at Midnight)</i>
Quiz 3	10/25 (Class)	Chapters 21 and 22 (Aromaticity and Rxns of Benzene)
Conjugation and Pericyclic Reactions (Diels-Alder, Cope/Claisen)	10/25, 11/1 (Class)	Chapter 20 Q. 20.14-20.17, 20.27-20.31, 20.34, 20.37-20.39, 20.44-20.50 <i>(HW6 Due Sunday, Nov 7th at Midnight)</i>
Exam 2	11/8 (Class)	Topics: Aromaticity, Reactions of Benzene, and Pericyclic Reactions
Amines	11/15 (Class)	Chapter 23

		<p>Q. 23.18, 23.25, 23.35-23.42, 23.44, 23.49, 23.50, 23.52, 23.53, 23.59, 23.65</p> <p>(HW7 Due Sunday, Nov 21st at Midnight)</p>
C-C Bond Formation (Metathesis)	11/15 (Metathesis)	<p>Chapter 24</p> <p>Q. 24.8-24.13, 24.16, 24.19, 24.20, 24.23-24.26, 24.32-24.34, 24.35, 24.39</p> <p>(HW7 Due Sunday, Nov 21st at Midnight)</p>
Quiz 4	11/22 (Class)	Topics: Amines and Metathesis
C-C Bond Formation (Pd-Catalyzed C-C Bond Formation)	11/22, 11/29 (Pd-Catalysis)	<p>Chapter 24</p> <p>Q. 24.8-24.13, 24.16, 24.19, 24.20, 24.23-24.26, 24.32-24.34, 24.35, 24.39</p> <p>(HW8 Due Sunday, Dec 5th at Midnight)</p>
Polymers	11/29 (Class)	<p>Chapter 29</p> <p>Q. 29.7-29.10, 29.14, 29.17, 29.25-29.28, 29.38</p> <p>(HW8 Due Sunday, Dec 5th at Midnight)</p>
Quiz 5	12/6 (Class)	Topics: Pd-Catalyzed C-C bond formation and Polymers
Lipids	12/6	<p>Chapter 26</p> <p>Q. 26.2, 26.3, 26.19, 26.24, 26.25,</p> <p>(HW9 Due Sunday, Dec 12th at Midnight)</p>
Amino Acids and Peptides/Proteins	12/6	<p>Chapter 27</p> <p>Also read: www.mdpi.com/1420-3049/19/9/14461/pdf</p> <p>Q 27.43, 27.48, 27.45, 27.51-27.53</p> <p>(HW9 Due Sunday, Dec 12th at Midnight)</p>
Carbohydrates and Nucleic Acids	12/6	<p>Chapter 25 and 28d</p> <p>Also watch following: https://www.youtube.com/watch?v=g17QmtZOyWc</p>

		Q. 25.12, 25.20-25.22, 25.30 (HW9 Due Sunday, Dec 12 th at Midnight)
Exam 3	12/13	Topics: Amines, Metal-Catalyzed C-C Bond Formation, Polymers, and Biomolecules
Final Exam	12/20*	*We are 'M9' course code, which is currently scheduled for December 20 th at 8 am. The current exam schedule