

Chemistry 221: Organic Chemistry I, Fall 2017

Section	Chem 221-09B
Meeting Time	MWF 9:30–10:35 am
Location	OSB 423
Instructor	Dr. Annette Neuman
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Office	OSB 404
Office Hours	Tuesdays 1:00–3:00 pm, Wednesdays 1:00–3:00 pm, Thursdays 9:45–11:45 am (drop-in) Or by appointment (e-mail me to set up a time)
Description	<p>All life depends on molecules containing carbon, known as organic compounds. Organic Chemistry I is the first course in a two-semester sequence in which you will examine the special attributes of carbon that make it well suited to such an important task.</p> <p>Oxford College is dedicated to a liberal arts education. The ultimate goal of a liberal arts education is not to provide a collection of knowledge, but rather to teach you how to think and how to learn. The study of science is an integral part of a liberal arts education, and mastery of organic chemistry will serve you well whether you pursue a career in science, healthcare, or another field. Success in organic chemistry requires a thorough understanding of fundamental principles and the ability to use these principles to analyze, classify, and predict. Medicine and other fields make similar demands. Your mastery of organic chemistry will not only provide you with knowledge about the molecules of life; it will also hone the critical thinking skills that will be invaluable in your career.</p> <p>In Chemistry 221, you will develop strong skills in problem solving as you study concepts that explain how the world works. The skills you develop in organic chemistry will be invaluable as you continue your studies in medicine or other fields.</p>
Learning Outcomes	<p>By the end of Chemistry 221, students will</p> <ol style="list-style-type: none">1. Classify and name organic compounds according to their functional groups,2. Predict physical and chemical properties of different classes of organic compounds according to their functional groups,3. Write reaction mechanisms for addition, elimination, and substitution reactions, and4. Represent three-dimensional structures of molecules and predict the stereochemical changes when a compound undergoes a chemical reaction.
Course Materials	<p>Required textbook: <i>Organic Chemistry</i>, 9th edition, by Leroy G. Wade and Jan William Simek</p> <p>Optional: <i>Student's Solutions Manual for Organic Chemistry</i>, 9th edition, by Wade and Simek Molecular model kit</p> <p>Bring a notebook and pen or pencil to every class. It is not necessary to bring your textbook.</p>

Topics	Chapter 1	Structure and Bonding
	Chapter 2	Acids and Bases; Functional Groups
	Chapter 3	Structure and Stereochemistry of Alkanes
	Chapter 4	The Study of Chemical Reactions
	Chapter 5	Stereochemistry
	Chapter 6	Alkyl Halides; Nucleophilic Substitution
	Chapter 7	Structure and Synthesis of Alkenes; Elimination
	Chapter 8	Reactions of Alkenes
	Chapter 9	Alkynes
	Chapter 10	Structure and Synthesis of Alcohols
	Chapter 11	Reactions of Alcohols

Grading	Participation	4%
	Quiz Total	10%
	Exam 1	19%
	Exam 2	19%
	Exam 3	24%
	Exam 4	24%
	Total	100%

Your final letter grade will be determined by the usual scale. *There is no automatic rounding or curve to course grades.*

	93		90		87		83		80		77		73		70		67		60	
A		A-		B+		B		B-		C+		C		C-		D+		D		F

In fairness to all students, grades must be based solely on your performance in the course. If you believe I have misgraded an assignment, please bring this to my attention immediately. Otherwise, **under no circumstances will grades be open for negotiation.**

Partial credit will be awarded at my discretion and is not open for negotiation.

Participation Engagement in the class meetings is helpful to your success in organic chemistry. For this reason, you will work in-class problems in groups on many days. I will collect your solutions and award participation points to everyone who contributed. (These solutions will only be graded for completeness, not for accuracy.) Volunteering your thoughts in class discussions and volunteering to write solutions on the board will also increase your participation score.

Problem Sets Students are responsible for **selected problems in the text** and **weekly assigned problem sets**. These problem sets will not be collected. Organic chemistry is learned *through the fingers*. Practice with a pencil and your models. Studious diligence with the problem sets immensely improves your understanding of organic chemistry and thus your performance in the class.

Quizzes Thirteen brief quizzes will be given in class **every Wednesday** to assess your understanding of the concepts discussed in the previous week of classes. The problems on these quizzes will be **heavily related** to the assigned homework problems. Therefore, though the problem sets will not be collected, **it is in your very best interest to work through every problem, every week**. Your three lowest quiz scores will be dropped, so that your total quiz score will be composed of your ten best quiz scores.

Exams

You will have four 65-minute in-class exams. The exams will be given during the regularly scheduled class period. **You may use model kits for each exam.**

Exam 1	Friday, September 15	Ch. 1-3
Exam 2	Friday, October 6	Ch. 4-6
Exam 3	Friday, November 3	Ch. 7-8
Exam 4	Monday, December 4	Ch. 9-11

Organic chemistry is comprehensive by its nature. Each exam will focus on the chapters listed above but will also assume mastery of previous topics. For this reason, **this class does not have a final exam.** Note that exams 3 and 4 are weighted more heavily than exams 1 and 2. This is because of the comprehensive nature of this class.

You are responsible for all material discussed in lecture in addition to assigned textbook readings and other supplemental materials. **Do the assigned reading!**

Makeups

If you must miss an exam, you must present me with an acceptable excuse **by the day of the exam.** If the excuse is considered acceptable, a makeup exam may be arranged to replace the missed exam. If the excuse is not considered acceptable, the exam grade will be a zero. It is up to my discretion whether an excuse is acceptable. In general, illness or an emergency are the only acceptable excuses for missing an exam. Missing an exam also counts as an absence in the course.

Review Sessions

Review sessions will be held one or two days before each exam, at a mutually agreed upon time. These sessions are completely optional and will give you the opportunity to ask me any questions you may have about the current material.

Expectations

Please behave in a manner that shows respect for me, your classmates, and yourself. Do not text or otherwise play on electronic devices during class. If this becomes a recurring issue, I will notice (whether or not I point it out), and **this distracting and disrespectful behavior will adversely affect your course grade.**

You should minimize your trips to the restroom or other reasons for leaving during class. You may excuse yourself from class if absolutely necessary, but this behavior is distracting and should be kept to a minimum.

Take responsibility for your own successes and failures. Work hard, and don't make excuses!

Honor Code

Academic integrity is crucial to the Oxford community. Therefore, as in all courses, you will be expected to adhere to the Oxford College Honor Code. Academic misconduct, as defined in the honor code, will not be tolerated and will be immediately referred to the Honor Council. **Collaboration is not permitted on quizzes or exams.**

Disability

If you are registered with the Office of Accessibility Services (OAS), please submit your documentation letter to me during the first week of the semester so that I can make appropriate accommodations.

Attendance	<p>All students are expected to attend all lecture and laboratory sessions. However, I recognize that emergencies can arise that may result in absence from class. You should notify me if an absence is due to illness or other emergency. You are responsible for all material covered in lecture if you are absent.</p> <p>Besides missing class, these also count as an absence:</p> <ol style="list-style-type: none"> 1. Being late to class three times. (This means coming in after I've finished checking the class roster.) If you come in late, it is your responsibility to see me immediately after class to ensure that you are marked as being tardy and not absent. No adjustments will be made at a later time. 2. Coming to class more than 15 minutes late. 3. Leaving class early. 4. Going in and out of class. 5. Being inattentive or working on other assignments in class. <p>You are allowed <i>3 absences</i> from lecture. If you exceed the 3 absence limit for <i>any</i> reason, by any combination of absences and tardies, you will:</p> <ol style="list-style-type: none"> 1. Lose 1 point for the next absence (absence 4) 2. Lose 2 points for the next absence (absence 5) 3. Lose 3 points for each additional absence <p>Note that each point deducted is a percentage point of your final grade. Therefore, excessive absences will have a significant negative impact on your course grade.</p>
Canvas	<p>The Chemistry 221 page on Canvas will be the primary means of communicating outside of class. It will also house supplementary course resources. Please be sure to check the course page daily.</p>
Student Work	<p>Student work submitted as part of this course may be reviewed by Oxford College and Emory College faculty and staff for the purposes of improving instruction and enhancing Emory education.</p>
Tips for Success	<p>You play the most important role in defining your success. Here are a number of tips that I suggest:</p> <ol style="list-style-type: none"> 1. PRACTICE, PRACTICE, PRACTICE! Organic chemistry is a course heavily based in problem solving. Do yourself a favor and stay ahead of the game. WORK PROBLEMS...really work them. Looking at the problem and then looking at the answer and saying, "Yeah, OK, I get it!" is passive studying of the <i>worst</i> kind. It not only does no good, it makes you overly optimistic about what you know. Too many students fool themselves into thinking they completely understand the material. If you cannot do the problems without looking at answers, you have actually learned very little. 2. Use the resources available to you: office hours, review sessions, and your classmates are all excellent resources to help you achieve success in this class. 3. The pace of this course is rapid. Stay current with the material, and don't get behind. 4. The average student will need to set aside <i>at least</i> eight hours a week to study for this class. Students come into this class with a wide variety of backgrounds. You may be able to get away with studying less than this, or you may need to devote much more time in order to succeed. Do not compare yourself to your classmates. Do what YOU need to do in order to succeed.

Anticipated Class Schedule (subject to minor changes):

Day	Date	Reading	Topics
W	Aug 23	1.1-1.8	Intro, Lewis structure review
F	Aug 25	1.9-1.10	Resonance, structural formulas
M	Aug 28	1.11-1.19	Atomic and molecular orbitals, hybridization, VSEPR theory, isomers
W	Aug 30	2.1-2.6	Quiz 1 , Polarity, intermolecular forces, acid-base review
F	Sep 1	2.7-2.15	Structural effects on acidity, Lewis acids and bases, curved arrows, hydrocarbons
M	Sep 4	---	NO CLASS—LABOR DAY
W	Sep 6	2.16-3.6	Quiz 2 , Functional groups, naming organic molecules, properties of alkanes
F	Sep 8	3.7-3.9	Conformations of alkanes
M	Sep 11	3.10-3.16	Cycloalkanes
W	Sep 13	4.1-4.7	Quiz 3 , Halogenation of alkanes, thermodynamics
F	Sep 15	---	Exam 1
M	Sep 18	4.8-4.14	Kinetics, Hammond's postulate
W	Sep 20	4.16-5.2	Quiz 4 , Reactive intermediates, chirality
F	Sep 22	5.3-5.9	R/S naming, plane-polarized light, biological discrimination, racemic mixtures
M	Sep 25	5.10-5.16	Drawing Fischer projections, diastereomers, separation of stereoisomers
W	Sep 27	6.1-6.6	Quiz 5 , Properties of alkyl halides, allylic bromination
F	Sep 29	6.7-6.12	The S _N 2 reaction
M	Oct 2	6.13-6.16	The S _N 1 reaction
W	Oct 4	7.1-7.8	Quiz 6 , Properties of alkenes
F	Oct 6	---	Exam 2
M	Oct 9	---	NO CLASS—FALL BREAK
W	Oct 11	7.9-7.11	Quiz 7 , The E1 reaction
F	Oct 13	7.12-7.15	The E2 reaction
M	Oct 16	7.16-7.18	Competition between substitution and elimination
W	Oct 18	8.1-8.2	Quiz 8 , Introduction to reactions of alkenes
F	Oct 20	8.3-8.4	Additions to alkenes (carbocation mechanisms)
M	Oct 23	8.5, 6, 8, 9, 12, 13	Additions to alkenes (three-membered ring mechanisms)
W	Oct 25	8.7, 10, 14	Quiz 9 , Additions to alkenes (concerted mechanisms)
F	Oct 27	8.15	Ozonolysis, synthesis practice
M	Oct 30	9.1-9.8	Properties and synthesis of alkynes
W	Nov 1	9.9	Quiz 10 , Addition reactions of alkynes
F	Nov 3	---	Exam 3
M	Nov 6	9.10-10.6	Oxidation of alkynes, properties of alcohols
W	Nov 8	10.7-10.10	Quiz 11 , Reactions of organometallic reagents
F	Nov 10	10.11-10.11	Reduction of ketones and aldehydes
M	Nov 13	10.12	Thiols, synthesis practice
W	Nov 15	11.1-11.4	Quiz 12 , Oxidation of alcohols
F	Nov 17	11.5-11.9	Conversion of alcohols to alkyl halides
M	Nov 20	11.10-11.11	Other reactions of alcohols
W	Nov 22	---	NO CLASS—THANKSGIVING BREAK
F	Nov 24	---	NO CLASS—THANKSGIVING BREAK
M	Nov 27	11.12-11.14	Synthesis of esters and ethers
W	Nov 29	---	Quiz 13 , Synthesis practice
F	Dec 1	---	Synthesis practice
M	Dec 4	---	Exam 4