

Organic Chemistry I
Chemistry 233 – Section 001/002
West Virginia University
Fall 2019

Instructor	Dr. Joshua Osbourn Office: 159 CRL (in the Chemistry Learning Center) E-mail: josbour1@mix.wvu.edu
Course Website	http://community.wvu.edu/~josbour1/pages/Chem233.html
Office Hours	Tuesday & Thursday 2:30- 3:20 pm In general, if my office door is open, feel free to come in with questions. You can also schedule a specific time via email if my regular office hours don't work with your schedule.
Meeting Times	Lecture: MWF 9:30 – 10:20 am in Ming-Hsieh G20 Recitation Section 001 – Tuesdays 2:30 – 3:20 pm in the Chemistry Learning Center Recitation Section 002 – Thursdays 2:30 – 3:20 pm in the Chemistry Learning Center
Textbook and Materials	<ul style="list-style-type: none">• Organic Chemistry, 9th ed., by John McMurry, Cengage Learning – \$119• OWLv2 Online Homework System, Cengage Learning – <i>Included with textbook</i>• Top Hat Subscription – \$37• Molecular Model Set – \$25 <p>See “Course Materials” link on the course website for additional details</p>
Course Pre-Requisite	Completion of Fundamentals of Chemistry II (Chemistry 116) or Principles of Chemistry II (Chemistry 118) with a C- or better letter grade.
Laboratory/Co-Requisite	Chemistry 235: Organic Chemistry Laboratory is a co-requisite for Chemistry 233. Unless you have prior approval, you must be enrolled in Chemistry 235 concurrently with Chemistry 233 or have previously completed Chemistry 235. If you do not show up for the first laboratory, you will be administratively dropped from the laboratory class list. Chem 235 lab begins the week of August 26, 2019. Chemistry 235 is a different course and a separate entity from Chemistry 233. This means that your Chemistry 235 laboratory grade will not influence (positively or negatively) your Chemistry 233 final grade.
Grading	The objective is to give you the best possible grade which can be justified by your achievement in the course. Your final course grade will be calculated using the following grading scheme. Exams 1, 2, & 3 – 54% (18% Each) Final Exam – 26% Homework – 5% Participation – 5% Quizzes – 10% Final numerical course averages secure the following letter grades: A: 90-100, B: 80-89, C: 70-79, D: 60-69, F: <60

- Exams** Three exams will be given on Thursday evenings from 7-8:30 PM. Exam room and seating assignments will be announced prior to the first exam. A comprehensive final exam will be given according to the university schedule based on class meeting time. The schedule for exams is:
- Exam 1** – Thursday September 26, 7-8:30 pm
Exam 2 – Thursday October 24, 7-8:30 pm
Exam 3 – Thursday November 14, 7-8:30 pm
Final Exam – Tuesday December 17, 2-4 pm
- You must read and agree to the statement of “Exam Instructions & Academic Integrity” prior to taking an exam. This document can be found on the course website and will also be emailed to you prior to the first exam.
- Makeup Exam Policy** If a student knows they will miss an exam due to University business, the instructor must be notified prior to the exam date. Failure to provide prior notice will constitute an unexcused absence.
- Students unexpectedly missing an exam due to a verifiable emergency must contact the instructor within twenty-four (24) hours of the start of the missed exam. At the instructor’s discretion, the final exam score can replace one “zero” score resulting from a legitimate exam absence.
- Quizzes** Periodic quizzes will be given during lecture (see lecture schedule). These quizzes will be about 10 min in length and will include material covered since the previous exam. The quizzes will be administered via Top Hat. Your one lowest quiz grade is dropped.
- Final Exam** The final exam will be comprehensive and cumulative. Therefore, it is weighted more heavily in the final grade determination. Due attention will be given to the cumulative nature of the learning process with emphasis being placed on major topics and concepts. Your study during the semester should be designed for comprehensive and long-term retention of the factual material, principles, and use of these. “Cramming” for individual exams largely defeats the purpose of a college education.
- The University sets the final exam day/time for each course. Please do not ask to take your final exam on a different day or different time.
- Homework** Graded online homework assignments for each chapter will be provided through the OWL platform. You can access the eBook, solutions manual, and online homework through OWL.
- Additionally, recommended homework problems from the book, chapter problem sets, and TopHat review questions will be available. These assignments will not be collected or graded. They are provided for your benefit. The single most effective way to learn organic chemistry is by working problems. Don’t put the homework off until the week before an exam. You should try to work a small chunk of problems every day in order to keep up with the material.
- Recitation** The weekly Chem 233 recitation will serve as an opportunity to work problems, ask questions, and have enhanced discussion of course topics in a (somewhat) smaller setting. Attendance at recitation is not required but is strongly encouraged. Recitation will be held during your scheduled time (T or R at 2:30 pm) in the Chemistry Learning Center.

Top Hat

- *Participation*
- *Attendance*
- *Quizzes*

For in-class participation, we will be using Top Hat. You will need to create an account at <https://app.tophat.com>. Top Hat requires a \$37 subscription fee for the semester. This fee will also cover any other courses using Top Hat.

You will be able to answer the in-Class Top Hat questions using a cellphone, tablet, or laptop computer. Participation in the in-class questions will account for 5% of your course grade. Each question will be graded as follows: 75% for answering, 25% for correctness.

Top Hat will also be used to administer periodic quizzes and to record lecture attendance.

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Attendance

Attendance will be taken in lecture using Top Hat. While class attendance is highly encouraged, it will have no bearing on your course grade. Attendance is taken solely for record keeping and course assessment purposes.

Expected Learning Outcomes

Carbon based molecules are central to biological processes, provide the building blocks for pharmaceutical drugs, and make up important polymers that are used daily. Organic molecules have a broad range of structural and reactivity characteristics that will be explored in this course. Chemistry 233 is the first semester of a two-semester sequence in organic chemistry. The aim of the organic chemistry sequence is to provide a broad breadth of the subject and an appreciation for organic molecules and their impact on science and society. Upon completion of the chemistry 233 course, students should be able to:

- explain and illustrate the principles of organic structure, hybridization, molecular representations, and reactivity trends.
- classify organic acids and bases and predict their trends.
- identify the differences among the various organic functional groups and predict trends in their physical and chemical properties.
- systematically name organic molecules including: alkanes, cycloalkanes, alkenes, alkynes, and organohalides.
- perform conformational analysis on alkanes and cycloalkanes.
- examine and diagram three-dimensional nature of organic molecules, stereochemical relationships, and explain how specific reactions affect the stereochemical outcomes of the reaction products.
- distinguish the types of reactions that organic compounds undergo and predict the outcome of these chemical reactions. This includes the reactions of alkanes, alkenes, alkynes, and organohalides.
- compare and contrast substitution and elimination reactions and determine the products from competition between the S_N1 , S_N2 , E1, and E2 mechanisms.
- formulate and draw reaction mechanisms using the curved arrow formalism to depict electron flow.
- determine and predict molecular stability, analyze reactive intermediates, and illustrate reaction thermodynamics using energy diagrams.
- apply retrosynthetic analysis and formulate syntheses for small molecules using the reactions discussed in the course.
- elucidate organic structural information using instrumental methods including: mass spectrometry, infrared spectroscopy, and NMR spectroscopy.

Course Advice

Exams are designed to test your problem-solving ability, not your ability to memorize the material. Even if you could memorize every single thing presented in the course, you will not perform well on the exams unless you are able to apply the concepts that you learn. Practicing problems is by far the best way to learn the material.

Old/Practice exams will be provided. These exams are provided to give you an idea of the types of questions that I like to ask, not to give you a comprehensive overview of what to expect on the actual exam.

Advice

- Become adept at reaction mechanism and electron-pushing using curved arrows.
- Think about how reactions can be combined in sequence to carry out complex chemical transformations.
- Work as many problems as humanly possible. The problems for every chapter are neatly organized while the questions on the exam are scrambled. I recommend mixing and matching problems when practicing for the exams.

Areas that Commonly Cause Problems:

- Skipping lecture. Even if you get lecture notes online, much of the context is lost.
- Doing problems while looking at the answer key without first attempting the problem on your own.
- Creating your own “rules” for organic chemistry that are not appropriate.
- Failing to keep up. We move at a very fast pace so don’t fall behind.

Incomplete Policy

A grade of incomplete is only given in the event of unforeseen, non-academic circumstances that prohibit a student from completing the last course assignment(s) at the end of the semester, as determined by the instructor. Students who are failing a course (exclusive of the incomplete work) may not request an incomplete. The incomplete policy at WVU can be found at: http://catalog.wvu.edu/graduate/advisingcoursesdegrees/advising_and_evaluation/

Academic Integrity

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University [Academic Standards Policy](http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification) (<http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification>). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter.

Inclusivity Statement

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with [the Office of Accessibility Services](https://accessibilityservices.wvu.edu/). (<https://accessibilityservices.wvu.edu/>)

More information is available at the [Division of Diversity, Equity, and Inclusion](https://diversity.wvu.edu/) (<https://diversity.wvu.edu/>) as well.

Adverse Weather Statement

In the event of inclement or threatening weather, everyone should use his or her best judgment regarding travel to and from campus. Safety should be the main concern. If you cannot get to class because of adverse weather conditions, you should contact me as soon as possible. Similarly, if I am unable to reach our class location, I will notify you of any cancellation or change as soon as possible before class starts, using email to prevent you from embarking on any unnecessary travel. If you cannot get to class because of weather conditions, I will make allowances relative to required attendance policies, as well as any scheduled tests, quizzes, or other assessments.

Sale of Course Material Statement

All course materials, including lectures, class notes, quizzes, exams, handouts, presentations, and other course materials provided to students for their courses are protected intellectual property. As such, the unauthorized purchase or sale of these materials may result in disciplinary sanctions under the [Student Conduct Code](https://studentconduct.wvu.edu/policies-and-procedures). (<https://studentconduct.wvu.edu/policies-and-procedures>)

**Chemistry 233 Fall 2019
Tentative Schedule**

Date	Chapter	Topic	
August	21	1	Course Introduction; Structure and Bonding
	23	1	Structure and Bonding
	26	1	Structure and Bonding
	28	1	Structure and Bonding
	30	2	Polar Covalent Compounds: Acids and Bases
September	2	-	<i>Labor Day - No Class</i>
	4	2	Polar Covalent Compounds: Acids and Bases
	6	2	Polar Covalent Compounds: Acids and Bases
	9	2	Polar Covalent Compounds: Acids and Bases and Quiz 1
	11	3	Organic Compounds: Alkanes and Their Stereochemistry
	13	3	Organic Compounds: Alkanes and Their Stereochemistry
	16	3	Organic Compounds: Alkanes and Their Stereochemistry
	18	3	Organic Compounds: Alkanes and Their Stereochemistry
	20	3	Organic Compounds: Alkanes and Their Stereochemistry
	23	4	Organic Compounds: Cycloalkanes and Their Stereochemistry
	25	4	Organic Compounds: Cycloalkanes and Their Stereochemistry
	26	-	Exam 1 (7-8:30 pm)
	27	4	Organic Compounds: Cycloalkanes and Their Stereochemistry
	30	5	Stereochemistry at Tetrahedral Centers
	October	2	5
4		5	Stereochemistry at Tetrahedral Centers
7		5	Stereochemistry at Tetrahedral Centers
9		6	An Overview of Organic Reactions
11		-	<i>Fall Break – No Class</i>
14		6	An Overview of Organic Reactions and Quiz 2
16		7	Alkenes: Structure and Reactivity
18		7	Alkenes: Structure and Reactivity
21		7	Alkenes: Structure and Reactivity
13		8	Alkenes: Reactions and Synthesis
24		-	Exam 2 (7-8:30 pm)
25		8	Alkenes: Reactions and Synthesis
28		8	Alkenes: Reactions and Synthesis
30		8	Alkenes: Reactions and Synthesis
November		1	9
	4	9	Alkynes: An Introduction to Organic Synthesis
	6	9	Alkynes: An Introduction to Organic Synthesis
	8	13	Structure Determination: NMR and Quiz 3
	11	13	Structure Determination: NMR
	13	13	Structure Determination: NMR
	14		Exam 3 (7-8:30 pm)
	15	13	Structure Determination: NMR
	18	10	Organohalides
	20	10	Organohalides
	22	11	Reactions of Alkyl Halides
	25	-	<i>Fall Recess – No Class</i>
	27	-	<i>Fall Recess – No Class</i>
	29	-	<i>Fall Recess – No Class</i>
	December	2	11
4		11	Reactions of Alkyl Halides and Quiz 4
6		11	Reactions of Alkyl Halides
9		12	Structure Determination: Mass Spectrometry and Infrared Spectroscopy
11		12	Structure Determination: Mass Spectrometry and Infrared Spectroscopy
17			Final Exam (2-4 pm)