

Organic Chemistry II
Chemistry 234
West Virginia University
Summer 2019

Instructor	Dr. Joshua Osbourn Office: 159 CRL (in the Chemistry Learning Center) E-mail: josbour1@mix.wvu.edu or Joshua.osbourn@mail.wvu.edu
Office Hours	By Appointment In general, if my office door is open, feel free to come in with questions. You can also schedule a specific time via email.
Meeting Times	MTWR: 12:30 – 2:10 pm in Clark 112 (CRN 52047)
Textbook and Materials	<ul style="list-style-type: none">• Organic Chemistry, 9th ed., by John McMurry, Cengage Learning• Study Guide and Student Solutions Manual – eBook available through Cengage• Top Hat Subscription• Molecular Model Set – <i>Highly Recommended; May be used during exams</i>
Course Pre-Requisite	Passing grade in Organic Chemistry I (Chemistry 233). For chemistry majors, a grade of C or better in Chemistry 233 is required.
Laboratory/Co-Requisite	<p>Chemistry 236: Organic Chemistry Laboratory is a co-requisite for Chemistry 234. Unless you have prior approval, you must be enrolled in Chemistry 236 concurrently with Chemistry 234 or have previously completed Chemistry 236. If you do not show up for the first laboratory, you will be administratively dropped from the laboratory class list. Chem 236 lab begins on June 27, 2019.</p> <p>Chemistry 236 is a different course and a separate entity from Chemistry 234. This means that your Chemistry 236 laboratory grade will not influence (positively or negatively) your Chemistry 234 final grade.</p>
Websites	<p>http://community.wvu.edu/~josbour1/pages/Chem234.html All course materials including lecture notes, problem sets, and handouts.</p> <p>https://ecampus.wvu.edu eCampus will be used to post your course grades.</p>
Grading	<p>The objective is to give you the best possible grade that can be justified by your achievement in the course. Your final course grade will be calculated using the following grading scheme.</p> <p><u>Grading Breakdown</u> Exams 1, 2, & 3 – 54% (18% each) Final Exam – 26% Participation – 5% Homework – 5% Quizzes – 10%</p> <p>Grading Scale: A: 90-100, B: 80-89, C: 70-79, D: 60-69, F: <60</p>

- Exams** Three 90 min exams will be given during the scheduled class time in Clark 101. A 120 min comprehensive final exam will be given at the conclusion of the semester. The exam schedule is as follows:
- Exam 1** – Wednesday July 3rd, 12:30-2:00 pm
Exam 2 – Wednesday July 17th, 12:30-2:00 pm
Exam 3 – Thursday July 25th, 12:30-2:00 pm
Final Exam – Thursday August 1st, 12:30-2:30 pm
- Any type of communication or electronic device (cell phone, text messaging device, ipod, headphones, smartwatch, etc.) is prohibited during the exams. Place electronic devices in your book bag, which itself must be placed at the front or rear of the exam room. Any student caught with an electronic device during an exam will receive an “F” and will be brought up on charges of Academic Dishonesty.
- Makeup Exams** Consistent with WVU guidelines, students absent from regularly scheduled examinations because of authorized University activities will have the opportunity to take the exam at an alternate time. However, **prior** arrangements for such an absence must be made with the instructor. If an exam is missed for any other reason (work, illness, death in the family, etc.), at the instructor’s discretion, your final exam score will be used to replace your missed exam score.
- Quizzes** Four periodic quizzes will be at the end of 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 will be dropped. There are no makeup quizzes for any reason.
- Final Exam** The final exam will be comprehensive and cumulative. Therefore, it will be weighted more heavily in the final grade determination and is worth more than any of the individual exams. 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.
- Homework** Recommended homework problems from the book and chapter problem sets will be provided. These assignments will not be collected or graded but are provided for your benefit. There will also be graded homework assignments for each chapter assigned through TopHat. 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 the problems every night in order to keep up with the material. Doing the homework problems on Top Hat will be very beneficial but alone, will not be enough practice to prepare you for the exams. You must do additional practice problems to prepare.
- Attendance** Attendance may be taken periodically in lecture using Top Hat. This is for record keeping purposes but will have no bearing (positive or negative) on your course grade. Attendance will also be taken on quiz days to ensure that you are present in the lecture hall while taking the quiz.

Top Hat

- Participation
- Homework
- Quizzes

We will be using Top Hat for several things this semester. You will need to create an account at <https://app.tophat.com>. You will receive a registration email on the first day of class. Top Hat requires a \$36 subscription fee [includes Top Hat Classroom (\$26) + Top Hat Test (\$10)] for the semester. *If you purchased Top Hat for Summer I (Chem 233) your subscription will still be active. You simply need to add the new course.*

Top Hat will be used for regular “clicker” type questions in class. You will be able to answer these questions through Top Hat using a cellphone, tablet, or laptop computer. Participation in the clicker 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 for online homework assignments (typically one assignment per chapter) and for in-class quizzes. Additionally, there will be numerous additional questions on Top Hat available for review. These will not be graded but can be used for extra practice.

Summer 2019 Course Code: 784011

Exam Re-Grade Policy

Graduate teaching assistants in organic chemistry will grade the written portion of your exams. The TAs generally do a very good job grading the exams. Occasionally, however, grading errors are made. In the event of a suspected grading error, I am happy to re-grade your exam personally. If you are considering a re-grade, take note of the following:

- I will be adding 2 points to every exam to account for minor grading mistakes. When submitting your exam for a regrade, you forfeit the automatic 2 points.
- Your re-grade request must be made by the end of the next class period following the class in which the exams were returned. If you are not in class to pick up your graded exam, you forfeit the opportunity to request a regrade.
- The exam to be re-graded must be returned unaltered, with no additional writing or marks. If you turn in an exam to be regraded and have altered any of your answers, this is considered academic dishonesty and the penalties for academic misconduct will be vigorously enforced.
- **To submit your exam for a re-grade:** Attach a sheet to your exam containing a list of the question(s) that you would like re-graded. You should also include a very brief explanation as to why you think a grading error was made.
- I will re-grade your entire exam. This means your grade could increase, decrease, or remain the same.
- Note: Graded exams may be photocopied prior to return and the photocopy used for comparative purposes during re-grading.

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 234 is the second 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 234 course, students should be able to:

- explain and differentiate the physical and chemical properties of the different classes of organic compounds.
- distinguish between conjugated and non-conjugated systems and aromatic, anti-aromatic, and non-aromatic system, using an understanding of delocalized electrons and resonance to explain the stability differences in these systems.
- predict the products for a variety of reactions including those of: alcohols, ethers, epoxides, aromatic rings, amines, and carbonyl compounds.
- demonstrate an understanding of the aforementioned reactions and electron by drawing mechanisms using the curved arrow formalism.
- name various mono- and polyfunctional organic compounds including.
- elucidate structural information from NMR, IR, and Mass Spec. data, building upon these techniques discussed in Chem 233.
- demonstrate an understanding and utility of organometallic compounds including Grignard reagents, organocuprates, and palladium catalyzed coupling reactions.
- demonstrate problem solving ability by applying retrosynthetic analysis and using the reactions discussed in class to develop reasonable syntheses of small organic molecules.
- explain the fundamental concepts, structural features, and reactivity of bioorganic compounds including: carbohydrates, amino acids, proteins, and lipids.

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. Chem 234 moves at an even faster pace than Chem 233.

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, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. 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 Catalog at <http://catalog.wvu.edu/undergraduate/coursecredittermsclassification/#academicintegritytext>. 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 me before the assignment is due to discuss the matter. [adopted 2-11-08]

Academic dishonesty, as defined in Section 6.2.z (p. 6-7) of the WVU Student Conduct Code and Discipline Procedure (see <http://campuslife.wvu.edu/r/download/220286>; adopted: 8-21-2015) will be dealt with according to University policy as described in Section 7 (p. 9-10) of the WVU Student Conduct Code. The term “academic dishonesty” means plagiarism; cheating and dishonest practices in connection with examinations, papers, and/or projects; and forgery, misrepresentation, or fraud as it relates to academic or educational matters.

Academic dishonesty, in the form of “cheating and dishonest practices in connection with examinations, papers, and/or projects” means (i) giving or receiving of any unauthorized assistance in taking quizzes, tests, examinations, or any other assignment for a grade; (ii) depending upon the aid of sources beyond those authorized by the instructor in quizzes, tests, examinations, writing papers, preparing reports, solving problems, or carrying out other assignments; (iii) the acquisition or use, without permission, of tests or other academic material belonging to a member of the University faculty or staff; or (iv) engaging in any behavior specifically prohibited by a faculty member in the course syllabus or class discussion.

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 this class, please advise me and make appropriate arrangements with the Office of Accessibility Services (304-293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see <http://diversity.wvu.edu>.”

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. [adopted 9-8-2014]

Chemistry 234 Summer 2019 Tentative Schedule

Date		Chapter	Topic
June	24	14	Conjugated Compounds
	25	14	Conjugated Compounds
	26	15	Benzene and Aromaticity
	27	16	Chemistry of Benzene: Electrophilic Aromatic Substitution & Quiz 1
July	1	16	Chemistry of Benzene: Electrophilic Aromatic Substitution
	2	16	Chemistry of Benzene: Electrophilic Aromatic Substitution
	3	-	Exam 1
	4	-	<i>Independence Day - No Class</i>
	8	17	Alcohols and Phenols
	9	18	Ethers and Epoxides & Quiz 2
	10	ST	Synthetic Transformations of Carbonyl Compounds
	11	19	Aldehydes and Ketones: Nucleophilic Addition Reactions
	15	19	Aldehydes and Ketones: Nucleophilic Addition Reactions & Quiz 3
	16	20	Carboxylic Acids and Nitriles
	17	-	Exam 2
	18	20	Carboxylic Acids and Nitriles
	22	21	Carboxylic Acid Derivatives
	23	22	Carbonyl Alpha Substitution Reactions & Quiz 4
	24	23	Carbonyl Condensation Reactions
	25	-	Exam 3
	29	24	Amines
	30	OM	Organometallic Chemistry
August	31	25	Carbohydrates
	1	-	Final Exam

Due to the fast pace and condensed structure of the summer course, some lecture topics will be supplemented by short lecture videos. These videos should be treated as regular lecture material and the topics covered in these videos will be fair game for the exams.