

Chemistry 231: ORGANIC CHEMISTRY 1
Spring 2025

Instructor:

Dr. Kristen Baker

Office: Caputo Hall 317

Phone: 717-871-7419

Email: Kristen.Baker@millersville.edu (I generally respond to emails promptly and on the same day. However, I do check my email less frequently after 5 pm and on the weekends, so please take this into consideration when contacting me with any questions you may have!)

Office Hours:

No appointment needed! Arrive with any questions you may have about the course material or come to listen to your classmate's questions!

Monday 11:00 AM– 1:00 PM

Wednesday: 8:00 – 10:00 AM

Friday 9:00 – 10:00 AM

If these times do not work for you, please use the calendly link below to schedule a 15-minute block of time to meet with me! You may schedule up to 30 minutes (2 blocks) a day. If you cannot find a time on calendly that works for you, please send me an email and we can work something out!

Calendly link: <https://calendly.com/bakekr01/15-minute-meeting>

I highly encourage you to visit my office hours for any help you may need in this course, whether it be to work together on a specific problem or topic, go over how to study for a quiz, or discuss your grade in the class. In my experience, those who attend my office hours typically saw an increase in their understanding of the course material, leading to a higher grade in the course. As mentioned earlier, I am also available to meet at additional times either one-on-one or in a small group, just use the calendly link to schedule! (<https://calendly.com/bakekr01/15-minute-meeting>)

Chemistry Peer Learning Hours:

No appointment needed! Simply come to work on chemistry with your peers and get help from experienced tutors. Starts January 28th

Location: Caputo 211

Tuesday 5 – 7 PM

Wednesday 5 – 7 PM

Thursday 5 – 7 PM

Required Class Meetings:

1. Lecture (CRN 7776)

MWF, 10:00 AM – 10:50 AM

Location: 211 Caputo Hall

2. Laboratory

231 01A (CRN 7777) R 9:00 – 11:50 AM OR

235 01B (CRN 18458) R 1:10 – 4:00 PM

Location: 331 Caputo Hall

If you are unable to attend a class meeting, please email me asap.

Required Materials:

- *Organic Chemistry*, 4th Edition by David R. Klein (ISBN: 978111965959-4)
- *Organic Chemistry*, Student Solution Manual and Study Guide by David R. Klein (ISBN: 978-1-119-65952-5)

Please see [Millersville University textbook store](#) for more details.

D2L:

All important course information will be found on D2L. This includes lecture notes/videos, handouts, exams, quizzes, and answer keys. It is your responsibility to keep up with this material, including any information posted in an announcement.

Millersville Email:

Announcements may also be sent via email. Please check your email at least once a day.

Electronic Devices, Attendance, and In-Class Participation:

In order to succeed in this course, you need to attend class and be actively engaged in the lecture material by participating and taking meaningful notes. It is expected that while you are in lecture, your full attention is given to chemistry. Use of personal electronic devices will not be tolerated, except in cases where your device is used as an instructional tool (such as an iPad for notetaking/problem solving).

Inclusive Excellence Statement:

In this class, people of all different ethnicities, gender and gender identities, religions, ages, sexual orientations, disabilities, socioeconomic backgrounds, regions, and nationalities are encouraged to participate and share their perspectives and experiences that make each of us unique. Everyone will be expected to always treat each other with the utmost respect and consideration and without judgement. This classroom community will be a safe learning environment that encourages deep discussions based on everyone's individual perspective on the concepts learned. Any suggestions you may have on how to improve the effectiveness of the course are always encouraged and appreciated. Please do not hesitate to talk to me about any concerns you have about your success in this class.

Course Description:

Organic chemistry is the study of the structure, bonding, and reactivity of molecules containing carbon. Throughout this course, you will gain a fundamental understanding of the reactivity of carbon-containing compounds, but I hope you also gain an appreciation for organic chemistry and its role in modern society, including pharmaceuticals, agriculture, plastics and more. Most importantly, you will develop your analytical reasoning, problem solving and critical thinking skills throughout this course. Many of the questions we are seeking to answer might have multiple reasonable answers and it is our job to uncover as many of the pieces of the puzzle as we can. It is important to note that to succeed in this course (which I want you all to do!), you *cannot* just memorize the material. Instead, you must first understand the material and then learn how to apply this knowledge to how to approach problems, how to reason analytically, use logic, and how to communicate effectively. Throughout this journey we will do lots of practice problems, make mistakes (and learn from them), utilize potentially new learning strategies, and learn how to solve

puzzles. Please do not hesitate to reach out with any problems or concerns you may have throughout the semester!

Course Goals:

As your learning progresses, you should be able to confidently demonstrate your ability to...

1. Recognize, name, and draw organic compounds and organic functional groups.
2. Estimate, explain, and draw the attractive forces within and between molecules.
3. Analyze, explain, and draw structural conformations, configurations, and isomers.
4. Describe relationships between molecular structure, reactivity, and physical properties.
5. Apply acid and base chemistry concepts — ARIO (atom, resonance, induction, orbital) conjugate base stability method and the acid pKa value method — to analyze, draw, and explain a wide variety of reactions.
6. Describe reaction mechanism steps with elementary reaction names, and with Frontier Molecular Orbital (FMO) notation, and by utilizing curved-arrow notation.
7. Analyze reactants to propose and draw plausible reaction mechanisms (using curved-arrow notation to represent electron flow).
8. Describe, apply, compare & contrast, and evaluate organic functional group reactions.
9. Predict plausible products, reactants, or reagents (based on an understanding of—and application of—acid-base chemistry and functional group reactivity analysis).
10. Design multi-step synthesis of organic products by using functional group transformation reactions and carbon-carbon bond forming reactions.
11. Read, understand, and predict molecular-level details of biosynthetic pathways (based on your knowledge, skills, and ability to apply, analyze, and evaluate functional group transformation reactions).

Course Content:

This course will cover the following chapters in your textbook (not specifically in this order):

- Ch 1: Relevant General Chemistry
- Ch 2: Functional Groups & Resonance
- Ch 3: Acid-Base Reactions
- Ch 4: Alkane Naming & Conformations
- Ch 5: Stereoisomer Concepts
- Ch 6: Reaction Mechanism Basics
- Ch 17: Aromaticity & Acid-Base Reactions
- Ch 19: Aldehydes, Ketones, & Derivatives
- Ch 20: Carboxylic Acid Derivatives
- Ch 21: Enols & Enolates
- Ch 22: Amines

Grades:

Final grades will be based on the number of points you have earned collectively on homework assignments, In-Class Kahoot Quizzes, exams, in-class quizzes and laboratory work. You will have the opportunity to drop your lowest in-class quiz score.

Homework Assignments	12%
In-Class Kahoot Quizzes	6%
Weekly In-Class Quizzes	10%
Four exams	40% (10 % each)
Comprehensive final exam	12%
Laboratory*	20%

*A student cannot pass the course if they do not pass the laboratory portion.

Final grades will be based on the scale below. The minimum requirements for a particular grade may be lowered at my discretion.

A	>93%	B+	>87	C+	>77	D+	>67
A-	>90	B	>83	C	>73	D	>63
		B-	>80	C-	>70	D-	>60
						F	<59

University Approved Class Attendance Policy:

- Students are expected to attend all classes.** It is the student's responsibility to complete all course requirements even if a class is missed. If a student misses class for an officially excused reason, then he/she is entitled to make up the missed work but only at the convenience of the faculty member. Responsibility for materials presented in, assignments made for, and tests/quizzes given in regularly scheduled classes lies solely with the student.
- The University policy is that faculty will excuse absences for the following reasons:**
 - personal illness
 - death or critical illness in the family
 - participation in a university-sponsored activity
 - jury duty
 - military duties
 - religious holidays
- Faculty judge the validity of student absences from class within the University's approved guidelines and may require documentation for excused absences.** Faculty will evaluate any reason, other than those listed above, for a student missing class and determine whether the absence is justified. In these circumstances, a student may make up missed work at the discretion of the instructor.
- In the case of foreseeable absences, students are encouraged to notify the faculty member in advance.** A student who will miss class due to participation in an official University activity must notify the instructor well in advance of the activity to assure that the absence is excused.

Course Structure:

All material related to this course will be found on the D2L website. Before each lecture, I will post a 20-30 minute lecture video going over the concepts for that day's lecture. **You will be expected to watch the video *before* attending lecture.**

During each lecture, I will do a brief review of the key points from the video, followed by a Kahoot quiz. We will then do one practice problem together before splitting into small groups to work through the lecture problems. *Everyone is expected to participate in working on the problems.* Throughout this time, I will be available to answer any questions. If you would like further clarification on any concepts or problems, please do not hesitate to ask. It is very likely others in the class have the same question.

Homework Assignments:

You will have required chapter homework questions from the textbook. The best way to learn organic chemistry is through practice! Because you have the solution manual, this will be graded on completion. As such, please use the solution manual to check your work before turning in your homework on D2L. I will also provide additional textbook questions if you want more practice. Throughout the semester we will also have other types of homework assignments including weekly reflections.

Lecture Problems:

As detailed above, most of the time in our lecture meetings will be spent working through your lecture problems either as a class or in a small group, which is an important way of learning the material for this course. Participating in these practice problems will be crucial in your ability to succeed in this class. As such, I expect everyone to attend each lecture and to put effort into solving each lecture problem set. Each problem set is purposely longer than what we will have time to review in our lecture time so as to provide you with additional practice. Having the skills to think out loud and reason through a problem will benefit you throughout your career.

In-Class Kahoot Quizzes:

After we have quickly reviewed the lecture notes as a class, we will take a Kahoot quiz. As such, please go ahead and ***download the Kahoot app on your phone and make a free account.*** Kahoot quizzes will be graded on a combination of completion and correctness. These will be open note/open classmate quizzes, but there is a time limit for each question in this game-style quiz.

In-Class Quizzes:

Weekly quizzes will be given throughout the semester on Fridays during the first 20 minutes of class. The quiz will cover material from the previous Friday – Wednesday (the previous 3 lectures). Your lowest quiz grade will be dropped. Because I drop your lowest grade, **no makeup quizzes** will be given.

Exams:

There will be four exams given throughout the course of the semester. You will be expected to show your work on the exams. Exams will begin promptly at the beginning of class; if you arrive late, you will not be given extra time.

Make-up Policy: If you know you will miss an exam ahead of time (for an absence excused based on Millersville's approved guidelines), you must inform me one week in advance, ideally in person. *You will be expected to take the exam before the scheduled date.* If you are sick on the day of the exam, you must email me within 12 hours of the exam informing me of your illness. We will then discuss our options for a makeup exam.

Testing Accommodations: Students who may require academic accommodations based on their eligibility requirements should make the necessary arrangements as soon as possible. All accommodations must be arranged through the Office of Learning Services in Lyle Hall. You should plan to take the exam on the same day and time at the Office of Learning Services. More info: <https://www.millersville.edu/learningservices/>

Final Exam:

The final exam in this course is cumulative. *Tokens earned throughout the semester may be exchanged for an extra point on your final exam. To earn your first token, send me an email by January 31st with the subject "token". In this email, let me know anything in the syllabus you are confused about **and** send me your favorite cheesy joke!*

How I grade:

All points on exams and quizzes are earned rather than points being taken off for mistakes. Please be sure to read all instructions carefully and to provide a complete answer which may include pictures or diagrams. Your goal should be to show me that you fully understand the material that you are being asked about.

Exam Coverage and Tentative Dates:

Exam #1: Chapters 1-3 Friday, 2/14

Exam #2: Chapters 4-6 Friday, 3/7

Exam #3: Chapters 17, 19-20 Friday, 4/11

Exam #4: Chapters 21-22 Friday, 5/2

Cumulative Final Exam Date: 8AM – 10 AM on Thursday, May 8th, 2025

Study Recommendations:

A good rule of thumb for any college course is allotting 3-4 hours of studying per each lecture hour. After each lecture, you should review and study your class notes. Once you feel prepared, you should then attempt the problems handed out during class, either on your own or in small groups. I highly recommend forming study groups! The best way to study for this course is to actively solve problems. This does not have to all be done in one sitting, rather spend small periods of time on solving problems each day. During these study periods, ask yourself if you are using your study time and methods effectively. Organic chemistry requires your attention and practice every single day. It is to your advantage to keep up with your work as each subsequent chapter builds on the previous chapter. If you find yourself getting behind, please feel free to stop by my office to we can make a study schedule! In addition to studying by yourself or in a small group, I highly encourage you to attend my office hours.

Organic chemistry requires a lot of actively practicing problems...*you cannot just memorize!* Subsequent chapters build on material you learned previously, so you must know the early material like the back of your hand if you want to be able to tackle the harder material.

Potentially Useful Resources:

- Evans' pK_a Table: <http://goo.gl/f6Dl5q>
- Structural Database of Organic Compounds (SDBS), a database of compounds and their physical and spectroscopic properties: <http://goo.gl/5AoXa>
- Virtual Textbook of Organic Chemistry: <http://goo.gl/kgMGM>

Important Dates:

- January 28th, 2025 – last day to DROP/ ADD classes online; last day to request PASS/FAIL or AUDIT
- April 4th, 2025 – last day to DROP classes (with a ‘W’ grade)

Academic Conduct Code:

Academic dishonesty will not be tolerated. Not only is cheating unethical and disrespectful to your faculty and fellow students, it is also self-destructive to your own academic integrity. All students are expected to maintain high standards of academic integrity; you are responsible for understanding and abiding by the Millersville University Academic Honesty Policy outlined below. *If you break this policy, you will be assigned a failing grade and may be prosecuted by the Academic Review Board.* While you may work together on some assignments, all work turned in must be your own work and answers must be written in your own words. Forms of academic dishonesty include (but are not limited to) the use of cheat sheets during exams, copying answers from other students, plagiarizing material, knowingly allowing others to represent your work as their own, and use of online databases that provide “expert” answers to posted questions such as Chegg, Slader, CourseHero, and Koofers. Additionally, I own the copyright to all course materials, which may not be duplicated in any form other than for your own learning. This includes uploading these materials to any online sites that will provide “expert” answers or giving/receiving old course materials from other students.

Millersville University’s Academic Honesty Policy: Students of the University are expected to be honest and forthright in their academic endeavors. Actions that violate the Academic Honesty Policy include:

- Plagiarism (using someone else’s words, ideas, or data)
- Fabrication (falsifying results in research or other findings)
- Cheating (the act or attempted act of deception by which an individual tries to misrepresent that he/she has mastered subject matter in an academic project or the attempt to gain advantage by the use of illegal or illegitimate means)
- Academic Misconduct: violation of university policies by tampering with grades or participating in the distribution of any part of a test before its administration.

For more information:

<https://www.millersville.edu/cae/teaching-and-learning/academic-integrity.php>

<https://www.millersville.edu/about/administration/policies/pdf/academics/academic-policy-academic-honesty-and-dishonesty.pdf>

<https://www.millersville.edu/studentconduct/files/studentcodeofconduct.pdf>

Academic Support Services:

Students who may require academic accommodations based on their eligibility requirements should make the necessary arrangements as soon as possible. All accommodations must be arranged through the Office of Learning Services in Lyle Hall.

<https://www.millersville.edu/learningservices/>

Title IX Statement:

Millersville and its faculty are committed to maintaining a safe education environment for all students. In order to be in compliance with Title IX of the Education Amendments of 1972 and

guidance from the Office for Civil Rights, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (under 18 years of age) when the abuse allegedly occurred to the person. <https://www.millersville.edu/titleix/>

Counseling Reminder:

Students sometimes face mental health or drug/alcohol challenges in their academic careers that interfere with their academic performance goals. Millersville is a caring community and resources are available to assist students who are dealing with problems.

- Counseling Center (717-871-7821)
- Health Services (717-871-5250)
- Center for Health Education and Promotion (717-871-4141)
- Campus Ministries
- Learning Services (717-871-5554)

Americans with Disabilities Act:

Millersville University is committed to equality of opportunity and freedom from discrimination for all students, employees, applicants for admission or employment, and all participants in public University-sponsored activities. In keeping with this commitment, and in accordance with the Americans with Disabilities Act (ADA) the University will make every effort to provide equality of opportunity and freedom from discrimination for all members of the University community and visitors to the University, regardless of any disability an individual may have. Accordingly, the University has taken positive steps to make University facilities accessible to individuals with disabilities to participate in University programs. The University administration and management are obligated to report any allegation of discrimination to the appropriate office as defined in this policy.

Land Acknowledgement:

We would like to recognize the Native peoples of the lower Susquehanna River basin, those known and those unknown to us, who have stewarded the land, upon which Millersville University sits, for thousands of years. We acknowledge that the land on which we gather, study, and work is the ancestral land of the Conestogas, Susquehannocks, Shawnee, and others. One group, the Shenks Ferry people, had a village adjacent to the campus. We pay our respects to the traditional occupants and caretakers of this land.

Questions?? Concerns?? Stop by my office hours!

Monday 11:00 AM – 1:00 PM

Wednesday: 8:00 – 10:00 AM

Friday 9:00 – 10:00 AM

Tentative Textbook Assignment Schedule: Upload all work to D2L

Due Date	Textbook Problems
1/28 at midnight	Required: 1.1d, 1.3de, 1.4, 1.5, 1.6, 1.7, 1.8bc, 1.9, 1.10, 1.12, 1.13, 1.14, 1.19, 1.21, 1.22, 1.24, 1.25, 1.26, 1.27, 1.28bcfg, 1.29, 1.30, 1.31, 1.32 – 1.34all Recommended: 1.35 – 1.38all, 1.45, 1.46 – 1.50all, 1.53, 1.54, 1.55, 1.56, 1.62, 1.63 – 1.72all, 1.73, 1.82, & 1.83
2/4 at midnight	Required: 2.1 – 2.2, 2.4 – 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16, 2.18, 2.19, 2.20, 2.25, 2.26, 2.28, 2.31, 2.32, 2.33 Recommended: 2.37, 2.40, 2.45, 2.46 – 2.48, 2.53, 2.54, 2.55, 2.57, 2.58, 2.59, 2.60, 2.61, 2.63, 2.64 – 2.72, 2.74, 2.87, & 2.89
2/11 at midnight	Required: 3.1 – 3.33 Recommended: 3.34 – 3.84
2/25 at midnight	Required: 4.1, 4.4 – 4.10, 4.12, 4.13, 4.16, 4.19cd, 4.20 – 4.23, 4.24, 4.25bc, 4.26, 4.28cd, 4.29, 4.30c Recommended: 4.47 – 4.48, 4.50 – 4.54, 4.58, 4.61 – 4.69, 4.70, 4.72, 4.77, 4.79, & 4.82.
3/4 at midnight	Required: 5.1, 5.4, 5.7, 5.9, 5.10, 5.11, 5.15, 5.19, 5.24, 5.27, 5.28ad, 5.29, 5.30 AND 6.8 – 6.10, 6.11, 6.13, 6.15, 6.17, 6.18 Recommended: 5.31 – 5.34, 5.39, 5.50, 5.53, 5.57 – 5.63, 5.65a, 5.67a, & 5.76 AND 6.42 – 6.49, 6.54, 6.60, 6.62, & 6.64
3/25 at midnight	Required: 17.1, 17.2, 17.5, 17.8, 17.11, 17.13, 17.15, 17.16, Recommended: 17.24, 17.25, 17.31, 17.32, 17.33, 17.36, 17.39, 17.48, 17.52, & 17.53
4/1 at midnight	Required: 19.1, 19.2, 19.3, 19.4, 19.5 (use table 19.2), 19.6, 19.8b, 19.11, 19.13, 19.14b, 19.15d, 19.18, 19.20c, 19.24, 19.26a, 19.27, 19.28a, 19.30b, 19.32ab, 19.34a, 19.37, 19.38, 19.39 Recommended: 19.43, 19.44, 19.50, 19.54, 19.55, 19.57, 19.59c, 19.60b, 19.61bd, 19.68, 19.74 – 19.81, 19.95, & 19.99
4/8 at midnight	Required: 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9, 20.10 (use table 20.1), 20.11a, 20.12abefh, 20.13bcd, 20.14, 20.16, 20.17, 20.19, 20.20, 20.21a, 20.22def, 20.24, 20.25, 20.26, 20.27 Recommended: 20.35, 20.36, 20.37, 20.38, 20.44, 20.46, 20.48, 20.58, 20.70 – 20.74, 20.76, 20.77, 20.80, & 20.98
4/29 at midnight	Required: 21.1, 21.2, 21.3, 21.4, 21.5, 21.6ab, 21.8c, 21.9, 21.10a, 21.11, 21.12c, 21.14ad, 21.16, 21.17ace, 21.18, 21.19be, 21.20, 21.21, 21.25a, 21.29, 21.31a, 21.33, 21.35, 21.36 & 21.38 Recommended: 21.70, 20.75, 21.76, 21.83, 21.84, 21.87, 21.89 – 21.96

Tentative Weekly Reflection Schedule: Upload all work to D2L each Friday by midnight

Questions to include on all submissions	
1. How much time did you spend this week on organic chemistry? Did you follow last week's plan?	
2. What is your plan for next week?	
3. Any other reflections on your time spent this week?	
Additional Questions/Activities (Different each week)	
Week 1	How is Organic Chemistry Relevant to you?
Week 2	Wellness assignment
Week 3	Picture of functional group flashcards
Week 4	Mental Health Check-in
Week 5	Who inspires you?
Week 6	Stereochemistry Concept Map
Week 7	Favorite volunteer activity?
Week 9	Career planning
Week 10	Picture of Aldehyde/Ketone reaction flashcards
Week 11	Picture of Carboxylic acid reaction flashcards
Week 12	Mental Health Check-in
Week 13	Functional Group Transformations Concept Map
Week 14	ACS celebrates Earth Day! Research, participate, or volunteer in an aspect of Earth Day
Week 15	Mental Health check-in

Tentative Course Schedule:

Week/Dates	Topics Covered	Reading	Notes
Week #1 1/22 – 1/24	Introduction Lewis Structures, Valence Bond Theory	1.1-1.8	Token Opportunity: Office Hours Meet and Greet Quiz 1 on Friday (Pre-test)
Week #2 1/27 – 1/31	Molecular Orbital Theory Line angle notation, functional groups Chemical arrows, resonance	1.9-1.14 2.1-2.13	Quiz 2 on Friday
Week #3 2/3 – 2/7	Acids/bases	3.1-3.9	Quiz 3 on Friday
Week #4 2/10 – 2/14	Lewis acids/bases	3.10	Exam #1 Friday, 2/14
Week #5 2/17 – 2/21	Nomenclature/simple conformations Substituted conformations Cyclohexane	4.1-4.15	Quiz 4 on Friday
Week #6 2/24 – 2/28	CIP, chirality Stereoisomers, configuration Nucleophiles and Electrophiles	5.1-5.11 6.6-6.10	Token Opportunity: Midsemester Survey Quiz 5 on Friday
Week #7 3/3 – 3/7	Carbocations, Reversible/Irreversible Reaction Arrows	6.11-6.12	Exam #2 Friday, 3/7
Week #8 3/10 – 3/14	SPRING BREAK	NONE	NO CLASSES
Week #9 3/17 – 3/21	Aromaticity Aldehydes/Ketones: Nuc addition	17.1-17.5 19.1-19.4	Quiz 6 on Friday
Week #10 3/24 – 3/28	Aldehydes/Ketones: different Nucs Carboxylic Acids	19.5-19.12 20.1-20.10	Quiz 7 on Friday
Week #11 3/31 – 4/4	Acid Chlorides Acid Anhydrides, Esters Esters, amides, nitriles	20.11-20.13	Quiz 8 on Friday
Week #12 4/7 – 4/11	More CA Derivatives	21.1-21.2	Exam #3 Friday, 4/11
Week #13 4/14 – 4/18	Enols and Enolates, Aldol Claisen Alkylation Conjugate Addition	21.3-21.7	Quiz 9 on Friday
Week #14 4/21 – 4/25	Enolates in Synthesis Amines overview	22.1-22.3	Quiz 10 on Friday
Week #15 4/28 – 5/2	Amine reactions	22.4-22.6	Exam #4 Friday, 5/2
Week #16 5/5 – 5/9	Final exam review		Finals begin Tuesday!
Final Exam: Thursday, 5/8 from 8-10 AM			

Disclaimer: This syllabus and calendar may change over the course of the semester. All changes will be communicated in class and through a Canvas announcement or email.

Laboratory for Chemistry 231 Spring 2025

Laboratory Course Goals:

1. Demonstrate proper laboratory safety and waste disposal when working in the lab
2. Keep a neat and organized record of laboratory data in a notebook.
3. Set up apparatus for experimental techniques: reactions, distillations, filtrations, etc.
4. Purify organic products by recrystallization (solids) and distillation (liquids).
5. Characterize organic products by physical, chemical, and spectroscopic properties.

Laboratory Schedule:

WEEK	ACTIVITY
1	Safety and Core Concepts
2	Functional Groups and IR Spectroscopy
3	Recrystallization
4	Acid-Base Reactions and Acid-Base Extraction
5	Limonene Extraction via Steam Distillation
6	Conformational Analysis, Chirality, and Stereochemistry
7	Thin-Layer-Chromatography (TLC)
8	Spring Break
9	Oxone Oxidation of an aldehyde into a carboxylic acid
10	Acid cat. Cyclic acetal formation from benzaldehyde and pentaerythritol
11	Imine formation from an aldehyde (Multi-Step Synthesis- Step 1)
12	Imine formation from an aldehyde (Multi-Step Synthesis- Steps 2 and 3)
13	Proton and Carbon NMR
14	More Proton and Carbon NMR
15	Clean-up, post-test, final exam review

Chemistry 231 Laboratory Attendance Statement

Make-up labs are not an easy option (due primarily to scheduling and space limitations). If you are planning to miss a lab due to an official Millersville University event, or due to a foreseeable life event absence, or if you miss a lab due to an emergency, please email, as soon as possible, to begin discussing options; failure to begin discussing options within a timely manner will lead to this course policy: missing the first lab equals a zero for the lab activity, missing two labs equals a zero for the second lab activity, missing three or more labs equals failure of the entire course.

Academic Support Services:

Please see the Office of Learning Services in Lyle Hall as soon as possible if you have special learning needs for this class. If you have a condition that may affect your ability to perform laboratory exercises, to exit lab safely from the premises in an emergency, or which may cause an emergency during class, or lab, please discuss this in confidence with your instructor and someone at the Office of Student Support Services. Appropriate accommodations may then be provided.

<http://www.millersville.edu/learningservices/>