CHEM 042/044, INTRO ORGANIC CHEMISTRY

Section A (10088/10089), MWF 9:40-10:30am Innovation E102

University of Vermont

Spring Semester 2023

---

## GENERAL INFORMATION

INSTRUCTOR: Amy Hoeltge, Ph.D. EMAIL: Amy.Hoeltge@uvm.edu

OFFICE: Innovation E337 OFFICE HOURS: drop in or by appointment

---

## COURSE DESCRIPTION

This is a one semester introductory course in organic chemistry. Material will include basic principles of organic chemistry including bonding, hybridization, resonance theory, isomerism, conformations of cyclic and acyclic alkanes, stereoisomerism, chirality, optical properties of stereoisomers, and nomenclature, reactions, and mechanisms of functional groups.

---

## REQUIRED COURSE MATERIALS

- TEXTBOOK: Introduction to Organic Chemistry; Brown, W. & Poon, T.; 6th Ed.
- LAB NOTEBOOK: A carbon-less copy notebook is required.
- SAFETY EYEWEAR: Everyone must wear OSHA approved safety glasses or goggles while in lab.

## RECOMMENDED COURSE MATERIALS

- MOLECULAR MODELING KIT: A plastic ball/stick pack specifically for Organic Chemistry. The Swpeet 115 piece kit is relatively inexpensive ($15-$20) and will offer everything needed to help visualize 3D structures, molecular geometries, and bonding. There are other kits out there… this is just one style I prefer.
- COLORED PENCILS/PENS/MARKERS: Helpful for highlighting specific pieces of functionality on a molecule… makes it easier to follow a proposed mechanistic pathway

## LECTURE

We will meet, in person, on MWF from 9:40-10:30 am, in Innovation E102. Attendance is not mandatory, though strongly encouraged.

- Lecture notes are created in class, not ahead of time. I will upload them to Blackboard at some point after class and you may access them on your own. Please realize that sharing these notes is not required of me and I will be doing it as a courtesy to you. The timing of each upload may vary but I usually have them ready within 24 hrs of each class.

- **Lectures are not recorded or livestreamed.** If you are unable to attend, **for any reason**, please arrange to acquire written notes from either a classmate, a peer notetaker (for those with accommodations), or from my uploaded file on Blackboard. Please do not email me asking for a Teams link for lecture.

---

## EXAMS

Dates/times for all exams are listed on the lecture schedule (attached to this document).

- Each of three mid-semester exams will consist of 30 multiple choice questions.

- These three mid-semester exams will be given **in person**, on Tuesday evenings from 6:40-9:40 pm in Billings Ira Allen LH.

- Use of notes, books, cell phones, laptops, tablets, or any outside resources is strictly prohibited on all exams. Students found using these resources will receive a grade of zero for the exam.

- The final exam is not cumulative. It will simply be a fourth exam comprised of 30 multiple choice questions. It will be held **in person** in Innovation E102.

- Attendance at all examinations and labs is required. A grade of zero will be assigned to any student who misses an exam. **This is firm: *without exception* there are no makeup exams, no alternate exam dates, and no online exam options.**

- Your single lowest exam score will not be "dropped". Rather, it will be replaced by your highest exam score. If you miss an exam, for any reason (excused or not), a zero will be given and that will count as your single lowest exam score. At the end of the semester, that zero will be replaced by your highest exam score. Students may not replace more than one zero. This means that if you miss more than one exam, one of the zeros will count toward your course grade. If you don't miss any exams, your single lowest exam score will be replaced by your highest exam score. So, everyone will have the opportunity to improve their exam average. See the Grading section for examples of how this works.

## EXAM REVIEW SESSIONS

Exam review sessions are held on Teams the Sunday before each of the three exams from 6:00-8:00 pm. If you keep up with the course work daily, you will be best prepared to benefit from these sessions. Attendance is optional but highly recommended for students having difficulty with the course. Each session will be recorded and uploaded to Blackboard. I will provide a link to the session prior to its date.

---

## HOMEWORK

A long list of suggested practice problems can be found at the end of this syllabus, in the lecture schedule. These exercises will not be collected or graded. However, failure to master these problems will certainly not lead to a wildly successful experience in this course.

---

## ONLINE QUIZZES

There will be an assortment of extra credit quizzes offered during the semester. These present an opportunity to polish your skills and grab a few bonus points to bolster your course grade. There is no official due date for these. However, **they will become unavailable at 11:59pm on Wednesday, 5/10/23**, the day before your final exam. These quizzes can be found in Blackboard.

---

## LAB

*More information can be found on the Blackboard page for your lab section.*

- Before the start of lab, purchase your lab manual, lab notebook, and safety glasses. On your lab's Blackboard page, review and complete the Safety Presentation and Safety Quiz. You will not be able to participate in lab until this is complete.

- Students must attend the lab section to which they are assigned. **If more than two labs are missed, you will receive an F for the course.** Only the academic dean of your college may grant an incomplete. An unexcused absence will result in a ZERO grade for the laboratory experiment. Official documentation of sickness or a family crisis is required for an excused absence from lab.

GRADING

| | **CHEM 042 (4 credit course)** | **CHEM 044 (3 credit course)** |
|---|---|---|
| **Mid-semester exams** | 3 @ 150 pts ea = 450 pts | 3 @ 150 pts ea = 450 pts |
| **Final Exam** | 150 pts | 150 pts |
| **Lab** | 200 pts | n/a |
| **Course Total** | 800 pts | 600 pts |

- Your lowest exam score will be replaced by your highest exam score.
- A missing exam will be a zero and will count as your lowest exam score. If you have more than one missing exam, one of them will count as a zero.
- A note from the Dean's office does not excuse you from exam work or afford alternate exam date/time accommodations.
- You must take the final exam to pass the course.
- Letter grade cut offs are not determined until after the final exam. However, in the past, whole letter ranges have generally trended as follows:

| **Total Course (%)** | **Letter Grade Range** |
|---|---|
| 88 – 100 | A |
| 78 – 87 | B |
| 68 – 77 | C |
| 58 – 67 | D |
| < 58 | F |

** These grade ranges are subject to shift based on class performance.*

** Your course % will be based on the total points possible associated with the course for which you are enrolled.*

GRADING EXAMPLES

**CHEM 042 Student A**
Exam 1: 135 pts
Exam 2: 130 pts
Exam 3: 0 pts
Lab: 190 pts
Final Exam: 115 pts
Total: 570 pts (71 % = C)

**CHEM 042 Student A**
Exam 1: 135 pts
Exam 2: 130 pts
Exam 3: 135 pts
Lab: 190 pts
Final Exam: 115 pts
Total: 705 pts (88 % = A)

**CHEM 042 Student B**
Exam 1: 0 pts
Exam 2: 135 pts
Exam 3: 0 pts
Lab: 188 pts
Final Exam: 125 pts
Total: 448 pts (56 % = F)

**CHEM 042 Student B**
Exam 1: 0 pts
Exam 2: 135 pts
Exam 3: 135 pts
Lab: 188 pts
Final Exam: 125 pts
Total: 583 pts (73 % = C)

**CHEM 042 Student C**
Exam 1: 105 pts
Exam 2: 130 pts
Exam 3: 65 pts
Lab: 164 pts
Final Exam: 95 pts
Total: 559 pts (70 % = C)

**CHEM 042 Student C**
Exam 1: 105 pts
Exam 2: 130 pts
Exam 3: 130 pts
Lab: 164 pts
Final Exam: 95 pts
Total: 624 pts (78 % = B)

** CHEM 044 students can follow the same pattern, minus lab.*
** Extra credit quiz points will be added to your total points at the end of the semester.*

---

OFFICE HOURS

If you would like additional help in the course, you may drop in or schedule a specific time to meet with me. I am exceedingly available outside of class time, during evening hours, and on weekends. Drop ins are welcome any time my office door is open. For evenings and weekends, I kindly ask you to email me to arrange an in-person or Teams appointment.

Please send me an email at least two hours prior to our private session if you will not be able to make it. That way I can offer the time slot to one of your classmates.

## ACCOMMODATIONS

### Student Learning Accommodations Statement

"In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact ACCESS, the office of Disability Services on campus. ACCESS works with students to create reasonable and appropriate accommodations via an accommodation letter to their professors as early as possible each semester." Contact ACCESS: A170 Living/Learning Center - 802-656-7753

---

## ACADEMIC INTEGRITY

This policy addresses plagiarism, fabrication, cheating, and collusion.
**http://www.uvm.edu/policies/student/acaintegrity.pdf**

---

## FERPA RIGHTS DISCLOSURE

The purpose of this policy is to communicate the rights of students regarding access to, and privacy of their student educational records as provided for in the Family Educational Rights and Privacy Act (FERPA) of 1974. **https://catalogue.uvm.edu/undergraduate/academicinfo/ferparightsdisclosure/**

---

## RELIGIOUS HOLIDAYS

Students have the right to practice the religion of their choice. If you need to miss class to observe a religious holiday, please submit the dates of your absence to me in writing by the end of the second full week of classes. You will be permitted to make up work within a mutually agreed-upon time.
**https://www.uvm.edu/registrar/religious-holidays**

---

## HEALTH AND SAFETY

The University of Vermont's number one priority is to support a healthy and safe community:

**Center for Health and Wellbeing: https://www.uvm.edu/health**

**Counseling & Psychiatry Services (CAPS): (802) 656-3340**

**C.A.R.E.:** If you are concerned about a UVM community member or are concerned about a specific event, we encourage you to contact the Dean of Students Office (802-656-3380). If you would like to remain anonymous, you can report your concerns online by visiting the Dean of Students website at **https://www.uvm.edu/studentaffairs**

DIVERSITY, EQUITY, AND INCLUSION

The Division of Diversity, Equity, and Inclusion believes excellence should be inclusive of the entire University of Vermont (UVM) community and is steadfastly committed to this belief. Every day, our division strives to make our work accessible, affirming, and action-oriented to help ensure excellence is inclusive of everyone. **https://www.uvm.edu/diversity**

---

INTERFAITH CENTER

Each of us engages those questions differently, perhaps through a religious tradition, philosophy, or spiritual practice. No matter how you make meaning of your life, you are welcome at the Interfaith Center for reflection, spiritual practice, education, and community building.
**https://www.uvm.edu/interfaithcenter**

---

MOSAIC CENTER FOR STUDENTS OF COLOR

MCSC's vision is to create a diverse and rich community of empowered, engaged, and enthusiastic students of color at UVM. We fully support the holistic development of self-identified students of color so that they can obtain their goals for academic achievement, personal growth, identity formation, and cultural development. **https://www.uvm.edu/mcsc**

---

**PRISM CENTER**

The Prism Center serves the diverse queer and trans communities at the University of Vermont. We support and empower lesbian, gay, bisexual, transgender and queer students, as well as students whose identities fall in between or expand beyond those categories, and work to create a campus community where people of all sexual and gender identities can thrive. **https://www.uvm.edu/prism**

---

UVM WOMEN & GENDER EQUITY CENTER

**The equity center cultivates joyful community while advancing gender equity** across identities. We envision a brave, diverse, and equitable learning environment for all members of the UVM community. We provide advocacy services for those in our community who have experienced sexual or intimate partner violence, and strive to provide programming, education, and events that ask our community to explore the intersections of their gender and other identities.
**https://www.uvm.edu/wagecenter**

Spring 2023 TENTATIVE SCHEDULE

| DATES | CHAPTER | MATERIAL COVERED |
|---|---|---|
| Jan 18-20 | 1 and 2 | General Chemistry Review |
| Jan 23-27 | 1 and 2 | General Chemistry Review and Introduction to Organic Functional Groups |
| Jan 30 – Feb 3 | 3 and 4 | Structure & Nomenclature of Saturated & Unsaturated Hydrocarbons, and Isomerism |
| **Jan 30** | | **LAST DAY TO ADD/DROP** |
| Feb 6-10 | 7 and 8 | Structure, Classification, Properties, Nomenclature, of Alkyl Halides and Alcohols |
| Feb 13-17 | 6 | Stereoisomerism |
| **Feb 14** | **EXAM 1** | **Gen Chem Review and Structure & Nomenclature of Hydrocarbons, Alkyl Halides, and Alcohols** |
| Feb 20-24 | 7 | Substitution & Elimination Reactions of Alkyl Halides & Alcohols |
| **Feb 20** | | **NO CLASSES** |
| Feb 27 – Mar 3 | 7 | Substitution & Elimination Reactions of Alkyl Halides & Alcohols |
| Mar 6-10 | 5 | Reactions of Alkenes & Alkynes |
| **Mar 13-17** | | **SPRING BREAK** |
| Mar 20-24 | 8 | Structure, Properties, Nomenclature, and Reactions of Ethers and Thiols |
| **Mar 21** | **EXAM 2** | **Stereoisomerism, Subst. & Elim. Reactions, and Reactions of Alkenes & Alkynes** |
| Mar 27-31 | 9 | Structure, Properties, Nomenclature, and Reactions of Aromatic Compounds |
| Apr 3-7 | 10 | Structure, Classification, Properties, Nomenclature, and Reactions of Amines |
| **Apr 3** | | **LAST DAY TO WITHDRAW** |
| Apr 10-14 | 13 and 14 | Structure, Properties, Nomenclature, and Reactions of Carboxylic Acids & Their Derivatives |
| **Apr 11** | **EXAM 3** | **Ethers, Thiols, Aromatics, and Amines** |
| Apr 17-21 | 13 and 14 | Structure, Properties, Nomenclature, and Reactions of Carboxylic Acids & Their Derivatives |
| Apr 24-28 | 12 | Structure, Properties, Nomenclature, and Reactions of Aldehydes & Ketones |
| May 1-5 | 15 | Enolate Chemistry |
| **May 11** | **FINAL EXAM** | **Aldehydes & Ketones, and Enolate Chemistry ; (7:30 - 10:15am\| Innovation E102)** |

SUGGESTED PRACTICE PROBLEMS

*These exercises can be found at the end of each chapter. You can check your work in Appendix D of your textbook.*

| Chapter | Topic | Practice Exercises |
|---|---|---|
| **1** | Bonding & Molecular Geometries | 17,19,23,27,31,39,41,51,57,61,65,67 |
| **2** | Acid/Base Chemistry | 7,9,11,17,19,21,25,27,29,31,37 |
| **3** | Alkanes, Cycloalkanes, and Isomerism | 13,15,17,21,23,25,33,37,43,47,49,55 |
| **4** | Alkenes & Alkynes | 11,15,17,21,23,25,27,35,43 |
| **5** | Reactions of Alkenes & Alkynes | 15,17,19,21,23,25,27,29,31,33,35,37,41,43,45,47,49,51 |
| **6** | Stereoisomerism | 9,15,19,21,23,25,27,29,31,33,37,39 |
| **7** | Alkyl Halides, Substitution & Elimination Reactions | 9,11,13,15,17,19,21,23,25,27,29,31,35,43,45 |
| **8** | Alcohols, Thiols, and Ethers | 13,15,19,21,23,25,29,31,33,35,37,39,41abd,45,49a-d&f-j |
| **9** | Aromatic Compounds | 11,13,15,21,25,27,29,31,35,37,41,43 |
| **10** | Amines | 11,13,15,17,21,25,29,31,33,37,39,41,43,45,47 |
| **12** | Aldehydes and Ketones | 13,15,17,19,21,25,27,29,31,39,43,45,51 |
| **13** | Carboxylic Acids | 9,11,13,15,17,19,21,23,25,33,35,39,43,45,47,49,51 |
| **14** | Carboxylic Acid Derivatives | 9,15,17,19,21,25,27,29,31,33,35,45,49 |
| **15** | Enolate Chemistry | 13,15,17,19,25,27,29,31,33,37,39 |