Lecture Instructor: Professor Dave Martin
Office: E433 Chemistry Building
E-mail: david-martin@uiowa.edu
Office Hours: In person and/or via Zoom: Mon 1pm-2:30pm, Wed 10:30 am–12:00 pm, (or by appointment – email Dr. Martin)

Lecture: MWF 9:30 am–10:20 am, W268 CB
Final Exam: Week of Dec 12–16.
Teaching assistant: No TA for Fall 2022

Course Materials:
A molecular model kit (e.g. Duluth Labs, University Chem, Darling, Prentice Hall) is recommended and allowed in exams. **Models help you visualize organic molecules in 3D and improve your understanding**

Course Prerequisites: CHEM:2220 or CHEM:2240
Website: go to icon.uiowa.edu and log in

Lecture format: This course will be delivered in person at the scheduled time (MWF 9:30 am–10:20 am). I will mostly write notes out in real time with some slides and problems to work through alone or in groups. Lectures will be interactive, but your participation is key to making this happen! **Out of respect for your fellow classmates, please help make this a safe and healthy classroom environment by following University guidelines on COVID-19 and staying home if you feel ill or have been exposed to the virus. Lecture notes will be made available through ICON and I am available on Zoom to help keep up.**

Chemistry Center (Room E225 CB):
Chemistry Center for drop/add form signing, make-up exam scheduling, alternate textbooks, and tutor lists. The Chemistry Center manager is Trent Tappan (335-1341).

Review Sessions:
Review sessions will be held before each midterm and the final exam (Time and locations TBA).

Grading:
<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>100</td>
<td>Roughly once every week or two between exams</td>
</tr>
<tr>
<td>Exam I</td>
<td>75</td>
<td>Wednesday September 28th</td>
</tr>
<tr>
<td>Exam II</td>
<td>75</td>
<td>Wednesday November 2nd</td>
</tr>
<tr>
<td>Projects</td>
<td>100</td>
<td>Presentations after Thanksgiving break.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>150</td>
<td>Week of Dec 12–16, cumulative</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

Regrades
Turn in your exam to the TA or Dr. Martin no later than one week after the initial date of return if you believe that a mistake has been made in grading. Items to be regraded must be clearly explained on a cover page. After one week of the initial date of return, all grades are final.

Make-Up Exams:
Make-up exams are given under exceptional circumstances. A valid, written excuse must be provided prior to a missed exam to the Chemistry Center. If you anticipate having a conflict with an exam, please inform Dr. Martin and the Chemistry Center ahead of time.

Course Philosophy and Expectations:
This Advanced Organic Chemistry course will continue where Sophomore organic chemistry left off and cover a variety of reactions, synthesis strategies and literature examples. A thorough understanding of Sophomore organic chemistry is expected (see Organic Chemistry Survival Guide below). All students
should review the general topics & reaction types (underlined below) over the first couple weeks. The review of these concepts and assigned readings should be completed prior to lecture. **If you need help rebooting your knowledge of Sophomore organic chemistry, please attend Dr. Martin’s office hours.**

**Tentative Schedule of Lectures:** The chapters listed below represent a *best estimate* of the sequence of the course. We will aim to cover Chapters 1-4 + 8 of Starkey, 2nd Edition in this class. The 1st Edition has fewer problems and lacks Ch. 8. **Note that some chapters are longer than others (e.g. 3).**

<table>
<thead>
<tr>
<th>Week 1 (Aug 22)</th>
<th>Review, Ch. 1+2</th>
<th>Lewis structures, orbitals, bonding, resonance, acid/base, functional groups, reaction mechanisms.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2 (Aug 29)</td>
<td>Ch. 1+2</td>
<td>Reactions and retrosynthesis, functional groups, Nu and El,</td>
</tr>
<tr>
<td>Week 3 (Sep 6)</td>
<td>Ch. 1+2</td>
<td>oxidation/reduction, chemoselectivity and protecting groups.</td>
</tr>
<tr>
<td>Week 4 (Sep 12)</td>
<td>Ch. 3</td>
<td>Chemoselectivity and protecting groups, redox</td>
</tr>
<tr>
<td>Week 5 (Sep 19)</td>
<td>Ch. 3</td>
<td>Synthesis of “Monofunctional Target Molecules”, alcohols, ethers, amines by functional group interconversion.</td>
</tr>
<tr>
<td>Week 6 (Sep 26)</td>
<td>Ch. 3, EXAM I</td>
<td>Review.</td>
</tr>
<tr>
<td>Week 7 (Oct 3)</td>
<td>Ch. 3</td>
<td>More “1-FG Target Molecules”, alkenes, olefination</td>
</tr>
<tr>
<td>Week 8 (Oct 10)</td>
<td>Ch. 3</td>
<td>Olefination (not in book), alkynes, alkanes</td>
</tr>
<tr>
<td>Week 9 (Oct 17)</td>
<td>Ch. 3</td>
<td>Aldehydes and ketones, enolate reactions.</td>
</tr>
<tr>
<td>Week 10 (Oct 24)</td>
<td>Ch. 3-4,</td>
<td>Enolate reactions, roadmaps.</td>
</tr>
<tr>
<td>Week 11 (Oct 31)</td>
<td>Ch. 4, EXAM II</td>
<td>Enolate stereochemistry, Evans auxiliary.</td>
</tr>
<tr>
<td>Week 12 (Nov 7)</td>
<td>Ch. 4, 8</td>
<td>Aldol reaction, stereochemistry, transition metals.</td>
</tr>
<tr>
<td>Week 13 (Nov 14)</td>
<td>Ch. 8</td>
<td>Transition metal catalysis (Stille/Suzuki/Heck, etc.)</td>
</tr>
<tr>
<td>Week of Nov 21</td>
<td>n/a</td>
<td>Thanksgiving break.</td>
</tr>
<tr>
<td>Week 14 (Nov 28)</td>
<td>Ch. 8</td>
<td>TM catalysis, final project presentations</td>
</tr>
<tr>
<td>Week 15 (Dec 5)</td>
<td></td>
<td>Final project presentations, final exam review.</td>
</tr>
<tr>
<td>Week of Dec 12</td>
<td>FINAL EXAM</td>
<td>Comprehensive.</td>
</tr>
</tbody>
</table>

**Organic Chemistry Survival Guide:**

- Organic chemistry is fundamentally about the structure of organic molecules, how they react to form new molecules and how we can explain their reactivity by understanding their structure and bonding. If you have mastered concepts from General Chemistry such as Lewis structures, formal charge, molecular orbitals, resonance and hybridization, many things will become intuitive.

- **Organic chemistry is cumulative**. OChem, by its nature, is cumulative. You will need to know structure and bonding and electronegativity to understand reactivity. Concepts of intermolecular forces and polarity will appear over and over. We build on your knowledge of Sophomore organic chemistry and this understanding will also help you in Biochemistry and other subjects.

- Take notes and draw. OChem is a visual subject and drawing the structures yourself is the only way to get comfortable drawing them accurately and quickly. Drawing it will also help you remember.

**Chemistry Program Outcomes:**

This course will address the following program outcomes for students pursuing a bachelor’s degree in chemistry (or a minor in chemistry):

- An understanding of the relationship between molecular structure and physical/chemical properties
- Use modern library search tools such as SciFinder to locate and retrieve chemical information
- Read, analyze and critically evaluate journal articles in various subfields of chemistry
- Reference and cite chemical literature appropriately using ACS or other designated citation style
- Report scientific findings in oral presentations in a clear and organized fashion using appropriate visual tools
ATTENDANCE AND CLASSROOM EXPECTATIONS

Students are responsible for attending class and for knowing an instructor’s attendance policies, which vary by course and content area. All students are expected to attend class and to contribute to its learning environment in part by complying with University policies and directives regarding appropriate classroom behavior or other matters.

ABSENCES

Students are responsible for communicating with instructors as soon they know that an absence might occur or as soon as possible in the case of an illness or an unavoidable circumstance. Students can use the CLAS absences form to help communicate with instructors who will decide if the absence is excused or unexcused; the form is located on ICON within the top banner under “Student Tools.” Delays by students in communication with an instructor could result in a forfeit of what otherwise might be an excused absence (https://clas.uiowa.edu/students/handbook/attendance-absences).

ABSENCES: ILLNESS, UNAVOIDABLE CIRCUMSTANCES, AND UNIVERSITY SPONSORED ACTIVITIES

Students who are ill, in an unavoidable circumstance affecting academic work, or who miss class because of a University sponsored activity are allowed by UI policy to make up a missed exam. Documentation is required by the instructor except in the case of a brief illness. Students are responsible for communicating with instructors as soon as the absence is known (https://opsmanual.uiowa.edu/students/absences-class#8.1).

ABSENCES: HOLY DAYS

Reasonable accommodations are allowed for students whose religious holy days coincide with their classroom assignments, tests, and attendance if the student notifies the instructor in writing of any such religious Holy Day conflicts within the first days of the semester and no later than the third week. (See the UI Operations Manual, https://opsmanual.uiowa.edu/students/absences-class#8.2).

ABSENCES: MILITARY SERVICE OBLIGATIONS

Students absent from class due to U.S. veteran or U.S. military service obligations (including military service-related medical appointments, military orders, and National Guard Service obligations) must be excused without penalty. Instructors must make reasonable accommodations to allow students to make-up exams or other work. Students must communicate with their instructors about the expected possibility of missing class as soon as possible. (For more information, see https://opsmanual.uiowa.edu/lv-8-absences-class%2C%2A0-0).

ACADEMIC MISCONDUCT

All undergraduates enrolled in courses offered by CLAS have in essence agreed to the College's Code of Academic Honesty. Academic misconduct affects a student’s grade and is reported to the College which applies an additional sanction, such as suspension. Outcomes about misconduct are communicated through UI email (https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code).

ACADEMIC ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

UI is committed to providing an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as a mental health, attention, learning, vision, and a physical or health-related condition) through the Student Disability Services (SDS) office. The student is responsible for discussing specific accommodations with the instructor. Note that accommodations are not granted retroactively but from the time of the student’s request to the instructor onward; additionally, accommodations must be requested at least two weeks in advance of the related assignment or exam (https://sds.studentlife.uiowa.edu/).

CLASS RECORDINGS: PRIVACY AND SHARING

Course lectures and discussions are sometimes recorded or live-streamed. These are only available to students registered for the course and the intellectual property of the faculty member. These materials may not be shared or reproduced without the explicit written consent of the instructors. Students may not share these recordings with those who are not enrolled in the course; likewise, students may not upload recordings to any other online environment. Doing so is a breach of the Code of Student Conduct and could be a violation of the Federal Education Rights and Privacy Act (FERPA); also see https://dos.uiowa.edu/policies/code-of-student-life/.

COMMUNICATION: UI EMAIL

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community (Operations Manual, III.15.2). Emails should be respectful and brief, with complex matters addressed during the instructor’s drop-in hours, for example. Faculty are not expected to answer email after business hours or during the weekends.

COMPLAINTS ABOUT ACADEMIC MATTERS

Students with a complaint about a grade or a related academic issue should first visit with the instructor and then with the course supervisor (if one is assigned), and next with the Chair of the department or program offering the course. If not resolved, students may bring their concerns to the College of Liberal Arts and Sciences: https://clas.uiowa.edu/students/handbook/student-rights-responsibilities.
FINAL EXAMINATION POLICIES
The final exam schedule is published during the fifth week of the fall and spring semesters or on the first day of summer classes; students are responsible for knowing the date, time, and place of their final exams. Students should not make travel plans until knowing this information. A student with exams scheduled on the same day and time or who have more than two final exams on the same day should visit this page for how to resolve these problems by the given deadline: https://registrar.uiowa.edu/makeup-final-examination-policies. No exams may be scheduled the week before finals; some exception, however, have been made for labs, language courses, and off-cycle courses (https://registrar.uiowa.edu/final-examination-scheduling-policies).

FREE SPEECH AND EXPRESSION
The University of Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We are committed to open inquiry, vigorous debate, and creative expression inside and outside of the classroom. Visit Free Speech at Iowa for more information on the University's policies on free speech and academic freedom (https://freespeech.uiowa.edu/).

HOME OF THE COURSE
The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the course's add and drop deadlines, the "second-grade only" option (SG0), and other undergraduate policies and procedures. Different UI colleges may have other policies or deadlines. See https://clas.uiowa.edu/students/handbook. Questions? Contact CLAS at clasps@uiowa.edu or 319-335-2633.

MENTAL HEALTH
Students are encouraged to seek help as a preventive measure or if feeling stressed or overwhelmed. Students should talk to their instructors for guidance with specific class-related concerns and are encouraged to contact University Counseling Service (UCS) at 319-335-7294 during regular business hours to schedule an appointment. USC offers group and individual therapy as well as counseling for couples about relationships while making referrals to other resources (https://counseling.uiowa.edu/). Student Health can also address related concerns (https://studenthealth.uiowa.edu/). These visits are free to students. After hours, students are encouraged to call the Johnson County Community Crisis Line at (319) 351-0140 or dial 911 in an emergency.

NODISCRIMINATION IN THE CLASSROOM
The University of Iowa is committed to making the classroom a respectful and inclusive space for people of all gender, sexual, racial, religious, and other identities. Toward this goal, students are invited in MyUI to optionally share the names and pronouns they would like their instructors and advisors to use to address them. The University of Iowa prohibits discrimination and harassment against individuals based on race, class, gender, sexual orientation, national origin, and other identity categories indicated by the University's Human Rights policy. Contact the Office of Equal Opportunity and Diversity at https://diversity.uiowa.edu/division/office-equal-opportunity-and-diversity-eod.

SEXUAL HARASSMENT
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff; all members of the UI community are expected to conduct themselves in a manner that maintains an environment free from sexual harassment and sexual misconduct. Those experiencing sexual harassment are strongly encouraged to report the incidents and to seek help (https://osmrc.uiowa.edu/).

Diversity Statement
It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. Your suggestions about how to improve the value of diversity in this course are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.