CHEM:4372:001 – ADVANCED ORGANIC CHEMISTRY
Fall 2019 Syllabus

Lecture Instructor: Professor Dave Martin
Office: E433 Chemistry Building
E-mail: david-martin@uiowa.edu
Office Hours: E433 CB, Mondays 1pm-2:30pm, Wednesdays 10:30 am–12:00 pm, (or by appointment)

Lecture: MWF 9:30 am–10:20 am, W268 CB

Teaching assistant/grader: TBD

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

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>Item</th>
<th>Points</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>50</td>
<td>Roughly one every other week (in class or take home)</td>
</tr>
<tr>
<td>Exam I</td>
<td>100</td>
<td>Wednesday October 2nd (in class)</td>
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<tr>
<td>Exam II</td>
<td>100</td>
<td>Wednesday November 6th (in class)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
<td>Week of Dec 16–20, cumulative</td>
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<tr>
<td>Total</td>
<td>450</td>
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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 see 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.”**
Approximate Schedule of Lectures:  The chapters listed below represent a best estimate of the sequence of the course. We will aim to cover Chapters 1-8 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).

Week 1 (Aug 26)  Review, Ch. 1+2  Lewis structures, orbitals, bonding, resonance, acid/base, functional groups, reaction mechanisms.
Week 2 (Sep 3)  Ch. 1+2  Reactions and retrosynthesis, functional groups and protecting groups, Nu and El, oxidation and reduction.
Week 3 (Sep 9)  Ch. 1+2  Synthesis of “Monofunctional Target Molecules”, alcohols, ethers, halides, amines, alkenes etc. by functional group interconversion.
Week 4 (Sep 16)  Ch. 3  “2-FG Target Molecules” (enolate reactions).
Week 5 (Sep 23)  Ch. 3  “2-FG Target Molecules” (enolate reactions).
Week 6 (Sep 30)  Ch. 3, EXAM I  Aromatic substitution reactions (EAS and S_NAr).
Week 7 (Oct 7)  Ch. 3  More “1-FG Target Molecules”
Week 8 (Oct 14)  Ch. 4  “2-FG Target Molecules” (enolate reactions).
Week 9 (Oct 21)  Ch. 4  “2-FG Target Molecules” (enolate reactions).
Week 10 (Oct 28)  Ch. 5  Aromatic substitution reactions (EAS and S_NAr).
Week 11 (Nov 4)  Ch. 6, EXAM II  Ring-forming reactions.
Week 12 (Nov 11)  Ch. 6  Ring-forming reactions.
Week 13 (Nov 18)  Ch. 7  Radical reactions.
Week of Nov 25  n/a  Thanksgiving break.
Week 14 (Dec 2)  Ch. 7  Radical reactions.
Week 15 (Dec 9)  Ch. 8  Transition metal catalysis, review.
Week of Dec 16  FINAL EXAM  Comprehensive.

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.

- Keep up. You will probably find it helpful to read the textbook before (and after) class. It is essential that you practice the material and understand the solutions to problems before the exams. I recommend that you spend a few hours a week outside of lecture reading, reviewing, solving problems and discussing with others. Learn with and from each other. We will work on problem solving and as with anything else, practice makes perfect.

- 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 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.

College Statement

Absences and Attendance

Students are responsible for attending class and for contributing to the learning environment of a course. Students are also responsible for knowing the absence policies for their courses, which will vary by instructor. All absence policies, however, must uphold the UI policy related to student illness, mandatory religious obligations, unavoidable circumstances, or University authorized activities (https://clas.uiowa.edu/students/handbook/attendance-absences). Students may use this absence form to communicate with instructors: https://clas.uiowa.edu/sites/default/files/ABSENCE%20EXPLANATION%20FORM2019.pdf

**Dr. Martin will not take attendance in class, but students are responsible to learn the material and there will be no make-up quizzes for an unexcused absence.**
**Academic Integrity:** All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's [Code of Academic Honesty](https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code). Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through the UI email address (https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code).

**Accommodations for Disabilities:** UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as mental health, attention, learning, vision, and physical or health-related condition) by registering with Student Disability Services (SDS). The student is then responsible for discussing specific accommodations with the instructor. More information is at [https://sds.studentlife.uiowa.edu/](https://sds.studentlife.uiowa.edu/).

**Administrative home:** The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs matters such as add/drop deadlines, grading guidelines, absences and other related matters. Other colleges may have different policies. CLAS policies may be found here: [https://clas.uiowa.edu/students/handbook](https://clas.uiowa.edu/students/handbook).

**Communication and the Required Use of UI Email:** Students are responsible for official correspondences sent to the UI email address (uiowa.edu) and must use this address for all communication within UI ([Operations Manual, III.15.2](https://sds.studentlife.uiowa.edu/)).

**Complaints:** Students with a complaint about an academic issue should first visit with the instructor or course supervisor and then with the departmental executive officer (DEO), also known as the Chair of the department; students may next bring the issue to CLAS in 120 Schaeffer Hall. For more information, see [https://clas.uiowa.edu/students/handbook/student-rights-responsibilities](https://clas.uiowa.edu/students/handbook/student-rights-responsibilities).

**Final Examination Policies:** The final exam schedule is announced around the fifth week of classes; students are responsible for knowing the date, time, and place of a final exam. Students should not make travel plans until knowing this information. No exams of any kind are allowed the week before finals. Visit [https://registrar.uiowa.edu/final-examination-scheduling-policies](https://registrar.uiowa.edu/final-examination-scheduling-policies).

**Nondiscrimination in the Classroom:** UI is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University’s Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity ([diversity.uiowa.edu](http://diversity.uiowa.edu)).

**Reacting Safely to Severe Weather:** In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue, if possible, when the event is over. For more information on Hawk Alert and the siren warning system, visit [http://hawkalert.uiowa.edu](http://hawkalert.uiowa.edu) or [http://police.uiowa.edu](http://police.uiowa.edu).

**Understanding 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 must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, please see [https://osmrc.uiowa.edu/](https://osmrc.uiowa.edu/).