Organic Chemistry Lab for Chemical Sciences Majors

Instructor: Professor David F. Wiemer
Office: E531 CB
E-mail: david-wiemer@uiowa.edu

Note: Please write “2420” in the subject line.

Office Hours: In E427 CB 1:00–2:00 T/Th, during scheduled laboratory sessions when I’m in the labs, or by appointment.

Prerequisite: Grade of ‘C’ or higher in CHEM:2230 or CHEM:2210.

Corequisite: CHEM:2240 or 2220.

Lectures: Wednesday 8:30–9:20 AM W55 CB

Laboratory:
- Section 0A01 TTh 9:30–12:20 PM E424 CB (Hackbarth/Hartwick)
- Section 0A02 TTh 2:00–4:50 PM E424 CB (Moorman/Schneider)
- Section 0A03 MW 1:30–4:20 PM E424 CB (Tiba)

Laboratories will begin promptly at the scheduled starting time. No make-up labs are scheduled. Reasonable accommodations will be made for students with disabilities, according to standard UI policy. Please identify yourself to the instructor the first day of class so that appropriate adjustments can be made.

Website: The ICON site for this course will include general information, lecture notes, sample reports, practice exams, and a variety of other useful information. It should be checked frequently. (https://uiowa.instructure.com/courses/133553)

TAs: Jacob Hackbarth (jacob-hackbarth@uiowa.edu)
Chris Hartwick (christopher-hartwick@uiowa.edu)
Kathleen Moorman (kathleen-moorman@uiowa.edu)
Ashley Schneider (ashley-schneider@uiowa.edu)
Al Tiba (al-tiba@uiowa.edu)

Objectives: This course is intended to illustrate some important methods and reactions of organic chemistry, to highlight issues of stereochemistry, and to employ modern analytical instrumentation.


**Equipment:** Laboratory goggles are required.
An approved laboratory notebook that provides “carbonless copies” also is required.
Students must supply their own ruler and pencil.
Optional protective gear includes rubber (not latex) gloves and a lab coat.

**Course Administration:** Please go to the Chemistry Center (E225 CB) for drop/add signatures, section changes, and routine questions. They can also be reached at 319-335-1341 or chemistry-center@uiowa.edu. They are open during standard business hours.

Lists of office hours for the 2420 TA’s and other organic TA’s will be posted when they become available.

**Midterm Exams:** There will be two mid-term exams. Exams will consist of problems and essay questions. Answers must be written in ink, but not in red ink. Reasonable accommodations will be made for students with disabilities, according to standard UI policy.

<table>
<thead>
<tr>
<th>Exam I</th>
<th>Wednesday, March 11th</th>
<th>8:30 AM</th>
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<tbody>
<tr>
<td>Exam II</td>
<td>Wednesday, April 29th</td>
<td>8:30 AM</td>
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</table>

**Grade components:**

- Two Exams (100 pts each) ........................................... 200 pts
- Prelab flow charts (excluding first & last exps) .............. 100 pts
- Laboratory notebook entries (30 pts each for 8 exps.) ..... 240 pts
- Formal laboratory report: Davis reagents ......................... 60 pts
- Formal laboratory report: Wittig reaction ....................... 60 pts
- Unknown report .......................................................... 140 pts
- General laboratory performance ................................. 200 pts

1000 pts

Final letter grades will be assigned following the recommended guidelines of the College of Liberal Arts and Sciences for intermediate courses. (https://clas.uiowa.edu/faculty/grades-grading-system-and-distribution#Grading%20Guidelines)

**Reports:** Informal reports are derived primarily from the original pages of your lab notebook. A sample is provided under the General Information Section of our ICON site.

Formal reports must be typed or printed legibly in blue or black ink, and a sample will be posted at our ICON site. Reports not conforming to this format will be downgraded. Unless otherwise announced, reports will be due at the beginning of the period one week following completion of the experiment, and must be time-stamped in the lab. Late reports must be time-stamped and turned in to the TA during the next lab, and will be down-graded.
substantially. Reports will not be accepted more than 2 labs after the due date. Reports must be done individually, and must reflect the experimental findings of the student.

**Regrades:** Reports to be reconsidered should be given to the lab TA not later than 7 days after the initial date of return. Exams to be reconsidered should be turned in at the Chemistry Center, also not later than 7 days after the initial date of return.

Items for regrade must be written in ink, have the point in question clearly marked on the front page, and have an explanation no longer than one sentence. Items submitted for regrade will be considered in their entirety.

**Laboratory Performance:** This portion of the grade reflects how the student functions in the lab. Are you prepared? Do you work safely? Do you understand what you’re doing? Are your experiments finished in a timely way? Do you arrive/leave on time? Do you attend lecture?

**Attendance:** Students are expected to attend all lecture and laboratory sessions. Due to the complexity and schedule of the experiments, students in general may only attend the lab period for which they are registered. Additional make up experiments will not be permitted. Handouts may be distributed during lectures. “In-class” notes will not be distributed, but other information will be posted routinely on ICON. Quizzes may be given on occasion in the lecture.

**Course Distractions:** Cell phones, ipods, mp3 players, earbuds, etc. are not permitted in the laboratory or at lectures. If you are carrying a cell phone, please turn it off when you enter the lab or lecture.

**Safety:** Students are required to pass a safety quiz before their first day in the lab. Instructions are given at the ICON site. In addition:

1. Safety goggles must be worn at all times!
2. Wearing contact lenses in the lab is prohibited.
3. Feet must be completely covered. Laced shoes/sneakers or boots are required. (no sandals, no sandals with socks, no high heels, no ballet flats, no boat shoes, no shoes that do not have the toes, tops and backs of the feet covered).
4. Report any injury to your TA immediately – even if you think it is minor!
5. Legs must be covered. Shorts, short skirts and short dresses are not acceptable. Tank tops and muscle shirts are not permitted. Long hair must be tied back.
6. Students are allowed in the labs only during the assigned times and with proper supervision. Do not enter the lab if your TA is not present!
7. Eating, drinking, and smoking are prohibited in the laboratory.
8. No open flames are permitted in the laboratory.
9. Proper disposal of solvents, solids, and sharps is essential for the safety of all. If you are not sure how to dispose of something, ask your TA. Nothing goes down the drain!

10. Many organic chemicals pose potential hazards to the fetus or to young children. Women who are pregnant, nursing, or who suspect they may be pregnant are strongly advised to consult with their obstetrician, and if possible to take this course at a later time.

11. Come to lab prepared! This is the first rule of safety!

12. The language of instruction is English. Use of other languages in the lab will be considered a safety violation. Students will be warned once, and then dismissed from the lab that day for repeated violations.

13. Repeated violations of these safety practices will result in dismissal from the course.

NMR Warning:

NMR spectroscopy will be employed throughout this course, and the heart of any NMR spectrometer is a powerful magnet. Students with pacemakers or metallic implants must not approach this magnet. Please identify yourself to the instructor the first day of classes so that appropriate adjustments can be made.

Equipment:

All glassware and other equipment checked out at the beginning of the semester to a student registered for a given course and assigned a drawer/locker is the responsibility of that student. On the day of check-in the student must insure that the glassware has no chips or cracks and that the equipment is in good working order. The Chemistry Department will replace any glassware or equipment that is defective at the time of check-in. At the end of the semester, or at the time the student leaves the course, each piece of glassware and equipment must be returned to the Department without chips or cracks and in good working order. All pieces of glassware or equipment missing, chipped, broken, or not in good working order will be charged to the student through the University billing system.

Add/Drops:

Check-in is scheduled for Wednesday, January 22nd and Thursday January 23rd, during the normal section times. Students must check-in a lab drawer in their section before they can do the first experiment. Once you have checked into a lab drawer, if you drop the course you must check-out of that drawer with your TA to avoid any fees.

Clean Up:

Students are responsible for seeing that the lab is left clean.
# Tentative Schedule of Experiments

## Spring 2020

<table>
<thead>
<tr>
<th>Exp. #: (Pavia, 4th Pavia, 3rd)</th>
<th>Dates: Sections I,II &amp; III</th>
<th>Experiment:</th>
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<tbody>
<tr>
<td>Check-in; this is your glassware (sep funnel, kit)</td>
<td>Jan. 22/23</td>
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<tr>
<td>Separation of a multicomponent mixture by extraction. Identification of unknowns (22/28 and 28/34)</td>
<td>Jan. 27/28 Jan. 29/30</td>
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<tr>
<td>Distillation &amp; gas chromatography (38/44). Aldol reaction and NMR (306/309)</td>
<td>Feb. 3/4 Feb. 5/6</td>
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<tr>
<td>Friedel-Crafts Acylation and NMR (514-521/508-515).</td>
<td>Feb. 10/11 Feb. 11/12</td>
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<tr>
<td>Synthesis of acetaminophen and TLC of analgesics (57-70/64-73)</td>
<td>Feb. 17/18 Feb. 19/20</td>
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<tr>
<td>Isolate benzoin &amp; finish Exp. 43 Start oxid. of benzoin (32B, 269-271/272-274)</td>
<td>March 2/3 March 4/5</td>
<td></td>
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<tr>
<td>Benzil to benzilic acid (271-274/274-276) Start coumarin synthesis (handout)</td>
<td>March 9/10 March 11/12</td>
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<tr>
<td>(isolate coumarin) Synthesis of a Davis Reagent (handout)continued</td>
<td>March 23/24 March 25/26</td>
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<tr>
<td>continued continued</td>
<td>March 30/31 April ½</td>
<td></td>
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<tr>
<td>Wittig reaction (325/327) and handout</td>
<td>April 6/7 April 8/9</td>
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<tr>
<td>Enolate formation and alkylation (handout)</td>
<td>April 13/14 April 15/16</td>
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<tr>
<td>Identification of a solid and a liquid unknown (458-504/446-516)</td>
<td>April 20/21 thru May 4/5</td>
<td></td>
</tr>
<tr>
<td>Check-out</td>
<td>May 6/7</td>
<td></td>
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</tbody>
</table>
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 their course absence policies, which will vary by instructor. All absence policies, however, must uphold the UI policy related to student illness, mandatory religious obligations, including Holy Day obligations, unavoidable circumstances, or University authorized activities (https://clas.uiowa.edu/students/handbook/attendance-absences). Students may use this form to aid communication; the instructor will decide if the absence is excused (https://clas.uiowa.edu/sites/default/files/ABSENCE%20EXPLANATION%20FORM2019.pdf).

Academic Integrity. All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty. 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/.

Administrative Home of the Course. The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and related policies. Other colleges may have different policies. CLAS policies may be found here: 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).

Complaints. Students with a complaint about an academic issue should first visit with the instructor or course supervisor and then with the Chair of the department or program offering the course; students may next bring the issue to the College of Liberal Arts and Sciences. For more information, see 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.

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).

**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/.