Organic Chemistry Lab for Chemical Sciences Majors
Course Information

Instructor: Professor David F. Wiemer
Office: E531 CB
e-mail: david-wiemer@uiowa.edu
Note: Please write “142” in the subject line.

Office Hours: During scheduled laboratory sessions or by appointment

Prerequisite: Grade of ‘C’ or higher in 4:121 or 4:123.

Corequisite: 4:122 or 4:124

Lectures: Friday 2:30-3:20 PM W228 CB

Laboratory:
Section 1 MW 1:30-4:20 PM E424 CB (Ibrahim)
Section 2 TTh 9:30-12:20 PM E424 CB (Shippy)
Section 3 TTh 2:00-4:50 PM E424 CB (Kester)

Laboratories will begin promptly at the scheduled starting time. There will be no make-up labs. 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.

TAs: Class:
Sherif Ibrahim (sherif-ibrahim@uiowa.edu)
Rebekah Shippy (rebekah-shippy@uiowa.edu)
Kristin Kester (kristin-kester@uiowa.edu)

Instruments:
Chris Dunlay (christopher-dunlay@uiowa.edu)
Rachel Whitman (rachel-whitman@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 is required.
Students must supply their own ruler and pencil.
Optional protective gear includes rubber (not latex) gloves and a lab coat.
Exams:
  Exam I:     Friday, March 9th          2:30 PM
  Exam II:    Friday, May 4th           2:30 PM

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.

Grade components:
  Two Exams (100 pts each) .......................... 200 pts
  Prelab flow charts (excluding first & last exps) ....... 110 pts
  Laboratory notebook entries (30 pts each) ............. 390 pts
  Formal laboratory report: Davis reagents ............... 60 pts
  Formal laboratory report: Wittig reaction ............... 60 pts
  Unknown report ....................................... 140 pts
  General laboratory performance ........................ 200 pts

Reports:
  Reports must be typed or printed legibly in blue or black ink. Reports not conforming to this format will be downgraded. Unless otherwise announced, reports are due at the beginning of the period one week following completion of the experiment. Late reports must be turned in to the instructor, and will be down-graded substantially. Reports will not be accepted more than 3 days after the due date. Reports must be done individually, and must reflect the experimental findings of the student.

Regrades:
  Reports and exams to be reconsidered should be given to the lab TA 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 understand what you're doing? Do you work safely? Are your experiments completed in a timely fashion?

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 will be distributed during lectures. “In-class” notes will not be distributed, but other information will be posted routinely on ICON.
Chem Center: Chemistry Learning Center: E225 CB. Phone: 335-1341. Lists of office hours for the 142 TA’s and other organic TA’s will be posted when available. For students desiring additional assistance, the Chemistry Learning Center maintains a list of chemistry tutors.

Course Distractions: Cell phones, ipods, mp3 players, earbuds, etc. are not permitted in the laboratory. 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.
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.
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!

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.

**Clean Up:** Students are responsible for seeing that the lab is left clean. Your TA will prepare a schedule that designates students for clean up at the end of every lab.

**Drop Slips:** Students wishing to drop the course must check out of their lab drawer **before** a drop slip can be signed. Have your TA check your equipment and sign your course registration card. Take the signed card to the Chemistry Center to have your "Drop Slip" signed. Please don't wait until the last day because it may be difficult to find your TA.
## Schedule of Experiments (tentative) 4:142 Spring 2012

<table>
<thead>
<tr>
<th>Exp. #: (from Pavia)</th>
<th>Dates: Sections I/II &amp; III</th>
<th>Experiment:</th>
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<tbody>
<tr>
<td>Check-in</td>
<td>Jan. 18/19</td>
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<tr>
<td>3D and 4A</td>
<td>Jan. 23/24</td>
<td>Separation of a multicomponent mixture by extraction. Identification of unknowns (p. 28 and p. 34).</td>
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<td></td>
<td>Jan. 25/26</td>
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<tr>
<td>6 and 37</td>
<td>Jan. 30/31</td>
<td>Distillation &amp; gas chromatography (p. 44). Aldol reaction and NMR (p. 309)</td>
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<td></td>
<td>Feb. ½</td>
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<tr>
<td>57</td>
<td>Feb. 6/7</td>
<td>Isolation of an essential oil from spice (p. 497) GC-MS and NMR</td>
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<tr>
<td>9 and 10</td>
<td>Feb. 13/14</td>
<td>Synthesis of acetaminophen and TLC of analgesics (pp. 64-73)</td>
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<td>Feb. 15/16</td>
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<tr>
<td>20</td>
<td>Feb. 20/21</td>
<td>Competitive nucleophiles (pp. 163-172) Nitration of methyl benzoate (pp. 338-357) and set up benzoin condensation (pp. 266)</td>
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<td>43</td>
<td>Feb. 22/23</td>
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<tr>
<td>32A</td>
<td>Feb. 27/28</td>
<td>Isolate benzoin/finish Exp. 43 Oxidation of benzoin to benzil (Exp. 32B, pp. 272-274)</td>
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<td>Feb 29/March 1</td>
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<tr>
<td>32C</td>
<td>March 5/6</td>
<td>Benzil to benzilic acid (pp. 274-276) (prep of tetraphenylcyclopentadienone (2nd Ed; pp.300-2)</td>
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<td></td>
<td>March 7/8</td>
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<td>62</td>
<td>March 19/20</td>
<td>The aldehyde enigma (pp. 520-522) Synthesis of Davis Reagents (handout)</td>
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<td>Handout</td>
<td>March 21/22</td>
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<td>March 26/27</td>
<td>continued continued</td>
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<td>March 28/29</td>
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<td>40</td>
<td>April 2/3</td>
<td>Reactions of enamines: Synthesis of 2-acetylcylohexanone (2nd Ed; p. 330)</td>
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<td>April 4/5</td>
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<td>41</td>
<td>April 9/10</td>
<td>Wittig reaction (p. 327) and handout</td>
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<td>April 11/12</td>
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<td>55</td>
<td>April 16/17 thru April 30/May 1</td>
<td>Identification of a solid and a liquid unknown (pp. 467-516)</td>
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<td>May 2/3</td>
<td>Check-out</td>
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The College of Liberal Arts and Sciences
Policies and Procedures*

Administrative Home: The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Student Academic Handbook.

Electronic Communication: University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (name@uiowa.edu). Faculty and students should use this account for correspondences. (Operations Manual, III.15.2. Scroll down to k.11.)

Accommodations for Disabilities: A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

Academic Fraud: Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Academic Fraud section of the Student Academic Handbook.

CLAS Final Examination Policies: Final exams may be offered only during finals week. No exams of any kind are allowed during the last week of classes. Students should not ask their instructor to reschedule a final exam since the College does not permit rescheduling of a final exam once the semester has begun. Questions should be addressed to the Associate Dean for Undergraduate Programs and Curriculum.

Making a Suggestion or a Complaint: Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.

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 have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

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 the Public Safety web site.

*These CLAS policy and procedural statements have been summarized from the web pages of the College of Liberal Arts and Sciences and The University of Iowa Operations Manual.